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In This Issue

- ◆ How Tough Is Tough?
- ◆ The Third Berlin Offensive
- ◆ Hiroshima—Yesterday's Tomorrow?

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UNITED STATES ARMY COMMAND AND GENERAL STAFF COLLEGE

FORT LEAVENWORTH, KANSAS



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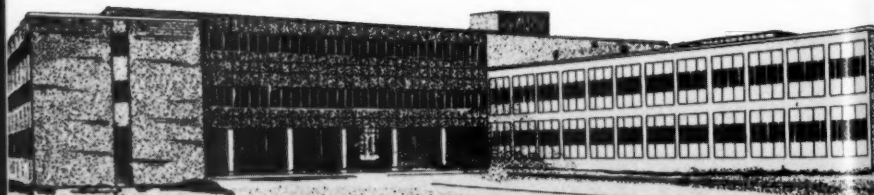
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CONTENTS

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How Tough Is Tough? 2

*Maj Reginald Hargreaves,
British Army, Ret*

Hiroshima—Yesterday's Tomorrow? 10

*Maj Gen Oh Duk-jun,
Republic of Korea Army, Ret*

The Third Berlin Offensive of the Cold War 17

Alfons Dalma

Defense of the British Commonwealth in North America and Europe . 26

Harald Husemann

Effect of Specialization on Leadership 39

Maj Herbert A. Schulke, Jr., USA

Logistic Support in Willow Freeze . 43

Lt Col Frank B. Case, USA

A Program for Self-Improvement . 56

Maj Lucian K. Truscott III, USA

On the Principles of War 61

John D. Keegan

Origin of the Metric System 73

*Lt Col Oskar Albrecht, Federal
Army of West Germany*

Command in the Pacific: 1941-45 . 76

Louis Morton

Reorganization of the Swiss Army . 89

*Maj Hans Rudolf Meyer,
Swiss Army*

Military Notes 92

Military Books 107

HOW TOUGH IS TOUGH?



Major Reginald Hargreaves, *British Army, Retired*

There is no sense in trying to round the rough angles of war.

—Abraham Lincoln

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etired IT IS a standard gibe that in peace the armed forces busy themselves preparing for the last war. What is so often overlooked is that it would be far easier to plan for the next war, if it were known against whom it would be waged, and exactly where the struggle would be fought.

In these days of quasi-peace the Western Powers can entertain few doubts as to the identity of their most likely antagonists. With the approximate parity in nuclear weapons oper-

ating as a deterrent to their employment, greater attention must be devoted to the likelihood of a conflict arising that would be fought with conventional weapons on more or less traditional lines. In envisaging this possibility, the further problem has to be considered—would such a war be fought against one or another of the principal opponents themselves, or with one of their obedient stooges?

Behind both the campaign in Korea and the bitter struggle in Malaya loomed the two colossi of Communist-imperialism, although the Soviet armed forces never openly took the field. In the current trouble spot of Laos the Pathet Lao guerrillas are based on North Vietnam, but everyone is perfectly aware that they are inspired and supported by the Chinese Communists.

Warfare waged by cat's-paw forces for a limited objective, and primarily designed to distract and fritter away anti-Communist manpower and resources, constitutes a challenge the Western Alliance must always be prepared to meet with the utmost resolution and dispatch. Sometimes a determined display of force—as in Lebanon—will obviate the need for its active employment. Sometimes—as in Korea—the counterchallenge will have to be made good by a resort to arms that stops short only at the introduction of major nuclear weapons. It is solely by such thoroughgoing measures that the satellite forces fronting for the manipulators of Sino-Soviet policy can be brought to question the advisability of "sticking their necks out" primarily for someone else's benefit.

With two-thirds of the world to choose from, the Communist leaders are in a position to foment a war in

any one of a number of territories. These territories differ widely in their climatic and topographical characteristics, each making special and peculiar demands on the troops committed to fight in them. There is every likelihood of the Communist leaders continuing their successful attempts to stage these exigent localized wars of attrition. Thus the question inevitably arises—is the training of the Western serviceman sufficiently diversified and rigorous for him to go into action anywhere in the world without the handicap of insufficient preparation for the task confronting him?

Climate and Terrain

Because Communist forces are so widely deployed, the possible theaters of war are almost endless. Even in a single theater the variety of physical characteristics of terrain and climate are wide. Our soldiers would find that fighting conditions in the Himalayan crags and the mountain ranges of the Pamirs differ widely from those in the jungles of Laos. The only thing common to both areas is an absence of anything like a developed road system.

On India's northwest frontier there are good highways penetrating into Afghanistan and into some of the tribal areas to the south. But lateral communications are sparse and difficult. In Laos the Western serviceman would find himself committed almost exclusively to jungle fighting. On NATO's northern flank he would face conditions in Norway that called for

Major Reginald Hargreaves, British Army, Retired, served in World Wars I and II. A frequent contributor to the MILITARY REVIEW, his latest work, "Thorn in the Flesh" appeared in the June 1961 issue. He has written on numerous military topics for publications throughout the world.

training such as is normally reserved for the French *Alpini*. To defend the oilfields at the head of the Persian Gulf, operations could as well commit him to the Lut Desert as to the tangle of peaks that run from Isfahan to Kerman.

All of this suggests, among other things, that it is high time that our soldiers are reintroduced to their feet, as furnishing the best all-round means of locomotion. This means all soldiers—not just infantrymen. For it appears to have been far too widely overlooked that there are many localities in which the employment of the armored troop carrier and much of the motorized transport, upon which the supply services have come to rely, would virtually be out of the question.

Lessons From the Past

A similar situation to that which arose in 1944—when the Allied 5th and 8th Armies, fighting in Italy, had to fall back almost exclusively on pack transport—could easily occur elsewhere. Veterans of the Korean campaigns will have no difficulty in recalling many situations in which wheeled transport was useless, and the unit or the individual could move only by putting one foot steadily in front of the other. To many of the troops it was a new and painfully wearing process. The Western serviceman of World War II had been encouraged to rely on mechanical transport to such a degree as to inhibit his marching powers almost entirely.

This is starkly revealed by an incident chronicled by Captain Antony Kimmins, Royal Navy. Shortly after the descent on North Africa Kimmins landed in the disembarkation area. He records:

I talked with an American soldier while halting to bind up his blistered

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feet, on the second day after we landed. He had been as game as you make 'em, but was furious with himself and his civilian occupation. 'How can you expect us to march?' he fumed. 'A few months ago I was a bell-hop in Chicago. I used to drive there in my automobile in the morning, go up and down in the elevator all day long, and take my girl friend to the movies in my automobile in the evening. Hell! I've never used my legs before.' But he got up and staggered on just the same.

The thought is not to be repressed, however, that had this unfortunate youngster's training included the weekly 20-mile route march common to most infantry battalions in pre-1914 days, he would have been an infinitely less distressed and considerably more efficient soldier; not that his plight was in any way uncommon.

Conditioning by Marching

Major John Dalgleish, in his book, *How We Planned the Second Front*, relates that when the troops gathered on Britain's south coast prior to embarkation for Normandy and D-day, an important point affecting the maintenance of morale was the marching distance between marshaling areas and embarkation areas. One pioneer company had marched 15 miles with full packs, and they had arrived at the embarkation point "flaked out." This was a bad thing, and the field force laid it down that the maximum distance to be marched must not exceed five miles. Eventually, this distance was reduced to three miles. It is evident that contemporary planning had lamentably failed to recall Suvorov's wise dictum that, "Victory depends upon the feet; the hands are only the tools of victory."

That this dangerous neglect to cul-

tivate the soldier's marching powers has not been remedied is witnessed by a recent report from Western Germany. A contingent of British troops, returning from a combined exercise with Bundeswehr elements, reported unfavorably on the German rations, but gleefully added, "we were taken everywhere by armored troop carriers and hardly had to march at all." All this mechanical transport was provided by the descendants of the men who, under Frederick the Great, marched 170 miles in less than a fortnight to fight and win the battle of Rossbach; and then immediately retraced their steps to crush the Austrians at Leuthen.

Difference in Background

What is so frequently and dangerously overlooked is the fundamental difference in the composition of the armies of the Western Powers and those of the Sino-Russian powers and their satellites.

The majority of Western recruits are urbanites, with all the city-bred individual's advantages—and defects. Readily responsive to instruction, speedily rendered adept with all the mechanical aids to warfare, at the same time they are far more excitable and pernickety, and less hardy physically than men brought up under the harsher conditions that accompany manual labor on the soil. Training toughens the town-dweller, and by the time he is ready to join a unit he has some right to consider himself tough. But the point is—in this context, just how tough is tough?

The Russian and Chinese armies, like those of their satellites, are made up almost exclusively of men of extremely virile, hard-wearing peasant stock. Writing of the Russian soldier,

HOW TOUGH IS TOUGH?

in particular, Otto Skorzeny has recorded:

They can sleep without hurt in wringing-wet clothes, march incredible distances, live on roots from the fields, and digest anything. They can tear hunks from a long-dead horse, and march on, refreshed. They can drink from marshes and shell holes; and subsist virtually without supply

yard. I believe he considered it perfectly natural that none of the hospital staff offered him any assistance.

To which may be added that, with the fullblooded oriental the sheer capacity for survival, like his stoicism under strain, his incredible stamina, and his disregard of injury or deprivation, is even more pronounced than with the semi-Asiatic Russian.



US Army

The Western soldier must have a barbarian body controlled by a civilized mind

columns, since they never hesitate to employ a human chain of old men and women to man-handle food and hump ammunition. We were amazed at the stoicism with which they bore their injuries. They could stand far more pain than a Western European. I myself saw a soldier, both of whose arms had been amputated, a few hours earlier, get up from his mattress and walk unaided to the latrine in the

Realistic Training

The Western serviceman, under everyday garrison conditions, is entitled to all the amenities with which he can be furnished. It cannot be too strongly emphasized or too clearly borne in mind that such conditions represent the abnormal. His normal state is that of a man committed to warfare, with everything reduced to that condition of primitiveness of

which conflict itself is the highest expression.

For all that, training programs rarely make provision for an exercise based upon sustained and stringent deprivation. Yet such a condition of temporarily having to do without arises in wartime over and over again. A detached force is ordered to hold on to an outlying position, which for

mate drop of water—everything.

It is in such a situation that some drastic earlier training in deprivation—in the art and science of surviving on nothing much more than the smell of an oily rag—would pay off handsomely. To undergo the experience of progressively “doing without” as part of the normal military education would greatly minimize its shock-potential



US Army

American guerrillas are well-adept in self-defense. Judo techniques are demonstrated here by two Army Special Forces instructors.

the time being cannot be reached by any ordinary means. To attempt an airdrop—such as Wingate's Chindits relied upon for their supplies when fighting in the Burmese jungle—would be only to draw attention to a location dangerously enough exposed as it is. Everything, from ammunition to emergency rations, has to be hoarded to the final round, the last crumb of food and shred of tobacco, the ulti-

mate drop of water—everything.

Sir Charles Snow, in his *Science and Government*, has cogently pointed out that:

Societies at about the same level of technology will produce similar inventions. It is quite unrealistic, and very dangerous, to imagine that the West as a whole can expect a permanent and decisive lead in military technol-

ogy over the East as a whole. That expectation is a typical piece of gadgeteer's thinking. It has done the West more harm than any other kind of thinking. History and science do not work that way.

If the West can aspire to hold its own in the invention and fabrication of weapons of mass destruction, then the nuclear deterrent will continue to operate. But the longer it persists, the greater the chance that, in matters that reach the stage of armed dispute, resort will be made to conventional weapons and the men who wield them. If the Western Powers can achieve and maintain parity with their Communist opponents in the means of waging scientific warfare, an equal effort is demanded of them to indoctrinate and train their manpower to attain a physical and mental toughness equal, if not superior, to that of their antagonists.

Decline of Nations

So far, history has invariably shown that degeneration follows upon a high state of civilization; the record of ancient times is the story of the decline and fall of one great nation after another. Civilization, after a certain point, tends to render a nation enervated and unfit for the struggle of life at a primitive level. Its people, thereupon, suffer conquest by others harder and more ruthless who have attained no such exquisiteness of cultivation—although subconsciously the “barbarian” may envy it and long for it. Just as the Greeks were destroyed by the unregarding power of Rome, so Rome itself—became decadent and soft—fell before the ruthless onrush of the Goths. In later days France—cultivated, civilized, refined, and sensitive—was overwhelmed by the rough

and brutal strength of the Germany of 1870.

Primitive peoples live under far harsher conditions than are known to more civilized nations. It follows that natural selection has greater play; weaklings die out at an early age, and those who survive to manhood are better adapted to the struggle of existence than the beneficiaries of a tenderly nurtured, luxurious way of life. Their grosser instincts are more powerful, more resilient.

Remedying the Situation

The first step in countering a danger is to recognize its existence.

The durable qualities boasted by the early Romans and the Goths nowadays characterize the warrior-masses of Communist imperialism, which are nothing less than the hordes of Genghis Khan and Tamerlane rendered doubly dangerous by possession of the most modern weapons. And it is upon their primitive level of forcefulness, endurance, and indifference to death or mutilation that the defenders of the Free World must be prepared to meet them. Their toughness must find something more than a match in ours—and toughness means a good deal more than exhibiting a hairy chest and relapsing into squalor at the very first opportunity.

There are, of course, specialist formations among the allied battle order that can compare in genuine toughness with any body of men that Communist imperialism can put into the field: the United States Special Forces Groups and the best of the Fleet Marine Force, the Parachute Regiment and the Royal Marine Commandos, the French Foreign Legion. But campaigns are not won by a few hand-picked *corps d'élite*; they are won—

or lost—according to the quality of the run of the ordinary rank and file. And their quality depends on the type of training to which they are subjected.

On their arrival in India, for example, the divisions that were to prove the backbone of the successful fight for Burma's recovery were no better and no worse than any other wartime formations. But it was painfully obvious that, as they stood, they were quite unequal to the task of fighting Japanese troops especially schooled for operations in this particular theater of war. So they were put to training, and they were trained the hard way—as were all their reinforcements. It took time, and it called for a lot of weeding out of those who found the demands made upon them altogether too grueling. In the end, what had been an ordinary run-of-the-mill formation turned into a body of men capable of bringing a wily, resourceful, and exceedingly tough enemy to surrender.

The Attraction of Hardship

It is a cardinal mistake, moreover, to believe that easygoing, undemanding training is the lure which attracts men to the ranks. On the contrary, as a recent British Parliamentary Report affirmed, "The arms which have least difficulty in attracting recruits are those where training is rigorous, discipline is strict, and smartness highly developed."

"Aptitude for war," Napoleon insisted, "is aptitude for movement"; and in his day movement meant marching. "All the mystery of movement and combat," wrote Marshal Saxe, "is in the legs, and it is to the legs that we should apply ourselves." In short, toughness—that is training—should start at the legs and work upward. What the Western serviceman must try to achieve is a barbarian body controlled by a civilized mind. With that, he is one up on his most probable opponents. With that, but with nothing short of that, he will be really tough.

Fitting Words:

1. "Push right along, close up fast."
2. "Close up, men, close up; push on, push on."

These were the verbal proddings of (1) Grant and (2) of Stonewall Jackson as they marched with their armies, on opposite sides of the struggle, to some specified rendezvous. For each it was imperative to reach a designated objective at X hours. Time and place entered into their estimate of the situation, absorbed their innermost thoughts, circulated through their nervous systems. The distance to the crossroads was translated into so many ticks of the clock, and the capability of the foot soldier was resolved into steps per minute. Stragglers have never won battles. Close up, push on.



HIROSHIMA- YESTERDAY'S TOMORROW?

The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the U. S. Army Command and General Staff College, or the government of the Republic of Korea.—Editor.

MONDAY, 6 August 1945 broke bright and hot over Hiroshima. Already at 0800 the glare outside my office window on the second floor of the brick barracks that housed the 104th Infantry Regiment gave promise of an uncomfortable day ahead.

In keeping with Japanese military custom I was serving the entire first week of August as duty officer. On the night of the 5th an alert had sounded and all officers and enlisted men moved to air raid shelters outside the city. Flights over Hiroshima suggested that the planes were reconnoitering preparatory to major air attack.

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**Major General Oh Duk-jun,
Republic of Korea Army, Retired**

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At this time the war was going badly for Japan—a continuous succession of battles and losses. Many B-29's flew daily over Japan, dropping their bombs on Nagoya, Tokyo, and other large cities. Hiroshima, however, had been spared; according to rumor the Americans were preparing something special for it. My regimental commander had said, "Hiroshima must be an open city and will not be bombed."

Nevertheless, the troops worked around the clock digging and shoring up tunnels in the hills near the city; tunnels that would shelter the headquarters and enable it to carry on its activities in event of major bombings. The work continued into August.

Although I am a Korean, my presence in Hiroshima on duty with the Japanese Imperial Army was not unusual. During World War II I was in Japan attending college. I had not expected to join the military service, but in January 1944 the Japanese extended conscription to include Korean college students. Thus forcefully conscripted, the Japanese Army assigned me on 20 January 1944 to the 48th Infantry Regiment at Okayama, as a second-class private. Following six months' recruit training I attained a first-class private's rank and then received noncommissioned officer training for the following four months.

Promotion to corporal and sergeant

Major General Oh Duk-jun, Republic of Korea Army, Retired, is Chairman of the Pusan Commercial Girls' High School. He is a veteran of 15 years' service in the ROK Army during which time he commanded the 9th, 11th, and 15th ROK Divisions, and served as commanding general of the III and V ROK Corps. He was graduated from the U. S. Army Command and General Staff College in 1954.

followed quickly and then success in the examination for officers' candidate school. Upon being graduated from the Officer Candidate School at Fuku-chiyama, near Kyoto, I was assigned to Central Army Headquarters at Hiroshima. My assignment was effective on 30 June 1945, whereupon I undertook my duties in the headquarters located some 600 yards southwest of famous old Hiroshima Castle.

Target City

Hiroshima was a fan-shaped city, spread across the delta of the Ota River, whose seven estuarial mouths, ribs in the fan, formed six islands extending into Hiroshima Bay. About three-quarters of its 380,000 inhabitants normally lived in the main commercial and residential areas covering 10 square kilometers in the center of the city. Factories and suburbs lay around the city's perimeter, rimmed by mountains that rose around the three sides of the delta. To the south were the docks, and then the sea itself speckled with little islands. Five evacuation programs had reduced the population to about 245,000 persons, and a sixth program was underway in August 1945.

The military barracks, centrally located within the city, sprawled over a roughly rectangular area about 1,000 by 1,200 meters, northeast of the point where the Motoyasu broke away from the Ota River. Hiroshima Castle, likewise centrally located within the military area, was approximately 1,000 meters northeast of the fateful river juncture, a natural reference point for anyone desirous of aiming at Hiroshima's vitals.

Nothing significant occurred during the night of the alert and my unit moved back to its duty station in town the next morning. Because of the

night's activity, the men did not fall out for reveille until 0700—one hour later than usual—and the subsequent morning's schedule fell an hour behind.

Following my prescribed inspection of the early formation, I returned to my office on the second floor of the barracks. Physical training (PT) was scheduled for 0900, leaving an hour during which I planned to take care of an accumulation of papers in my in-basket.

Intense Light and Heat

No sooner had I settled down to work at my desk than I came across a staff paper that required discussion with an officer on the first floor. Descending the stairs, I was about to put my left foot on the bottom tread when at precisely 0818, according to my watch, an intense light like that of a giant flashbulb cut across my vision. I was startled. Then heat came. I felt as though my tongue was afire.

Almost simultaneously the blast tossed me three or four meters. Luckily I landed in a dead space where no debris fell on top of me.

When I recovered my senses, I got up. Dust filtered down over everything and there was a strong odor of gas present. Putting my handkerchief over my nose, I went to the shelter behind the barracks, but could not enter because it was too hot. I didn't know why.

On the drill field to the rear of the barracks about half of the soldiers who assembled early for PT were sprawled on the ground. Others, with charred clothing and burns on the upper half of their bodies, (shirts had been removed preparatory to PT) stumbled around in confusion.

I made my way to the cement drainage ditch at the end of the drill field;

finding it cool, I entered it. About 10 minutes had passed since the explosion. I noticed two aircraft circling the city at about 1,000 feet altitude.

After about 30 minutes I moved out of the ditch. Everywhere I looked I saw only death and suffering. Particularly saddening was the fate of the conscripts and their families. A new class had arrived that very day and because the city was considered safe, many of their families had stayed to be near the new soldiers. Now hundreds of them lay dead.

Of the hundreds of wounded I noted particularly that none of the men acted irrationally, although a few of the women seemed to be incoherent and out of their minds. I might have misjudged the situation because it was difficult to tell the men from the women. Singed bodies and the loss of hair made them relatively indistinguishable. Strangely enough, all the dogs I saw were dead but the pigs, many of which were kept locally, had only singed hides.

Take to the Tunnels

Slowly the survivors regained their senses and organized themselves. I led 20 of my men to the tunnels outside Hiroshima, where providently we had stocked some food and other emergency necessities—but no medical supplies.

We arrived at the tunnels at about 1500. For the first time I realized that I, too, had been wounded. I had seen literally thousands of dead and wounded, but believed that I had escaped untouched. I felt poorly now. I rubbed my cheek and neck; water flowed profusely from blisters resulting from the thermal effects of the bomb. I had been burned almost precisely from my nose around the left side of my face. One knee was bleed-

ing, apparently a result of being thrown about by the blast.

Upon arrival at the tunnels, we rested for the most part; although some soldiers futilely searched for medicine in the rubble of nearby farmhouses. About 1700 I found some bean oil in a half-gallon jug. As a child I had known this to be an effective remedy for burns. I slathered some on my



US Army
General Oh Duk-jun taken before his retirement from the Republic of Korea Army

face and also assisted the soldiers in treating their burns. (I am convinced that had I not used the bean oil, my face today would be a mass of scars. It so happens that it is possible to see under a strong light only a few small patches of scar tissue on my neck and none on my face.)

Food and Medication Limited

A search of our tunnel turned up only rice and no other food to go with it. The men organized a hunting party, which brought back a pig. Because we had never heard of radiation we slaughtered the pig, cooked it, and ate

it in a kind of soup along with the rice.

That evening my face and neck and the torn knee became increasingly painful. All of us admitted to severe headaches but considering our experience we felt that this was not unusual.

By 1400 the next day the translucent water blisters, which had grown to the size of eggs, had turned yellow. We had no mirrors with which to examine our own wounds but we could look at each other and know that our injuries were similar. The egg-sized, yolk-colored blisters gave off an offensive odor. On some of the men who had been severely burned, I noted that the upper half of their bodies were covered with blisters the size of a man's fist. Since we were unable to locate medicine, we continued to daub each other with the bean oil. That night the pain and malaise increased.

The following day—8 August—eight men from my old regiment at Okayama arrived at the tunnel to help us, but they brought only Mercurochrome in the way of medicine. We resembled a platoon of Santa Clauses after the tincture was applied. That night we were evacuated by train to Hiba-gun, about 80 kilometers west of Hiroshima.

During the ride to Hiba-gun I mused over my experience of the past three days. I had witnessed death to an extent experienced by only a few men. Three hundred dead in one place—500 in another—and 1,000 dead in yet another; repeated many times. Nature had conspired against the Japanese in one respect. The 6th of August was a nice day full of sunshine. Adults unwittingly invited death when they lined up at bus and streetcar stations, and the children when they

romped in their schoolyards. All in all the consequences resembled a huge ant colony that had been stamped out by the boot of a giant.

None of us had really known what had happened or the nature of the weapon. My personal conclusion was that the US had dropped some type of new weapon or somehow had managed to release a tremendous quantity of some old type. Naturally, a constant source of concern was the possibility that they might return and attack again. But down in my heart I felt that this one raid really had ended the war.

Rolling along through the black of night, I recalled that my Christian minister in Korea had told my people that sometime in the future God would try man by fire. Perhaps this had been the trial.

Upon arrival at Hiba-gun I found that about 200 men had been assembled; we were quartered in a primary school. Treatment of the injured was inadequate because Mercurochrome still was the only medicine available. One of my men lived near the school house. At my suggestion his family obtained some zinc oxide, which some of the soldiers applied to their burn wounds.

About 10 or 20 victims died daily and the bodies were burned regularly about 90 meters from where we were quartered. I kept thinking that tomorrow might be my day. But I retained a belief in God and a strong determination to continue my medication.

Treatment Continued

At the end of the week about one-half of the patients at the school had died. I was more fortunate. My burns had begun to heal over. Up to that time I had feared that I was not a

sound man—that I might lose my nose or part of my neck and ear. Now the skin dried and it peeled, a little each day. After 10 days about one-half of the skin had peeled and I grew increasingly confident that I would live. I continued to use the bean oil and gave it to my soldiers, but many others used only the Mercurochrome. Many faces looked like *kabocha* (pumpkin).

On 5 September I left the emergency infirmary at Hiba-gun and returned to Korea by ship, arriving at Pusan on the 12th. By then almost all of the old skin had peeled from my wounds. Our real trouble throughout the ordeal was that no one knew how to treat such wounds.

I was all bandaged when my wife met me in Pusan (we had been married in 1943 and had one son). She wept, fearing that perhaps I had lost my nose or ear or other vital parts.

The next day I removed the bandages and happily my face appeared normal, except it was red as a beet. I then submitted to a Dr. No in Pusan who continued treatment. He, as the others, had no experience with nuclear injuries, and, therefore, didn't know what to prescribe. We continued the medication I already had used, and nothing else. We stopped treatment in November 1945 and by the summer of 1947 I had recovered fully, with absolutely no aftereffects.

My friends had told me that I would never recover, but I surprised them all. Both Japanese and US doctors had said that some atomic victims would lose their hair, some would die, and others would be incapable of reproduction. Today, 16 years after Hiroshima, I have a full head of hair and have fathered three sons and three daughters. I am very much alive.

I do not speculate on the gracious-

ness of the Almighty, but I think some credit for my fortunate situation springs from the simple treatment I used and my determination to survive. Of course, I was not exposed directly to radiation, but I incurred much of the thermal and blast effects of the weapon. I know other men could survive such a nuclear burst under similar conditions.

Strength Through Knowledge

I am telling this story to Americans and other people of the Free World

We know that the 20-kiloton bomb dropped on Hiroshima was a small weapon by today's standards. In the future, much higher yield weapons may be used. Nevertheless, the Hiroshima weapon spelled Japan's defeat. All people must realize that it was used only to end the war and to win peace. It did end the war—and brought peace temporarily.

You may wonder why a man who suffered from the bomb returned to his homeland only to become a pro-



US Army

Hiroshima, Japan, after the explosion on 5 August 1945

because I think that my experience was one by which they may profit. Ignorance is fear; today, we must have strength born of knowledge.

No people ever has been surprised like the Japanese were in 1945 by the use of atomic weapons. The Free World must not be similarly taken by surprise. The Japanese were afraid because they lacked knowledge.

fessional soldier. The reason lies in the thinking of the people of my village.

After the war I returned home and thought of teaching school, but some friends thought that we should build an army for the defense of Korea. So for two years I fought as a battalion and regimental commander in South Korea. Then I served as a regimental

and division commander in the Republic of Korea Army during the Korean War. I did this gladly because as long as there are human beings on this earth, they must have a country, and they must be ready to defend it. Today, progress in the development of nuclear weapons proceeds apace; thus the need to defend freedom and peace is correspondingly great. We must be prepared to fight for freedom under God; not admit to pessimism and wishy-washy acquiescence to peace at any price. The thought of nuclear war is appalling, but the thought of certain servitude is more appalling.

Many persons around the world say that we cannot defend against nuclear weapons. But I say that while we may not be able to prevent their use, we can defend ourselves. My experience suggests that it can be done.

Civilian and Military Support

If nuclear war comes, it will not only be a war of military units but all mankind will be involved. A strategy to prevent such war is absolutely necessary. It must be supported by both civilian and military measures, if for no other reason than to show the world that we understand what is at stake.

As a bare minimum, civil defense should undertake the following three-point program:

Train the public to understand what might occur and how to deal with it.

Disperse cities and vulnerable industrial areas.

Stockpile emergency food supplies and medicines outside populated areas.

Military training should be aimed at improving our readiness and proficiency in a nuclear environment. If the schools that I have attended are

indicative of our over-all training, I believe that our knowledge of the theory of nuclear weapons is adequate. I believe, too, that our weapons are adequate. Nevertheless, the training of ground combat units to cope with nuclear war is not what it must be, if we are to survive and win.

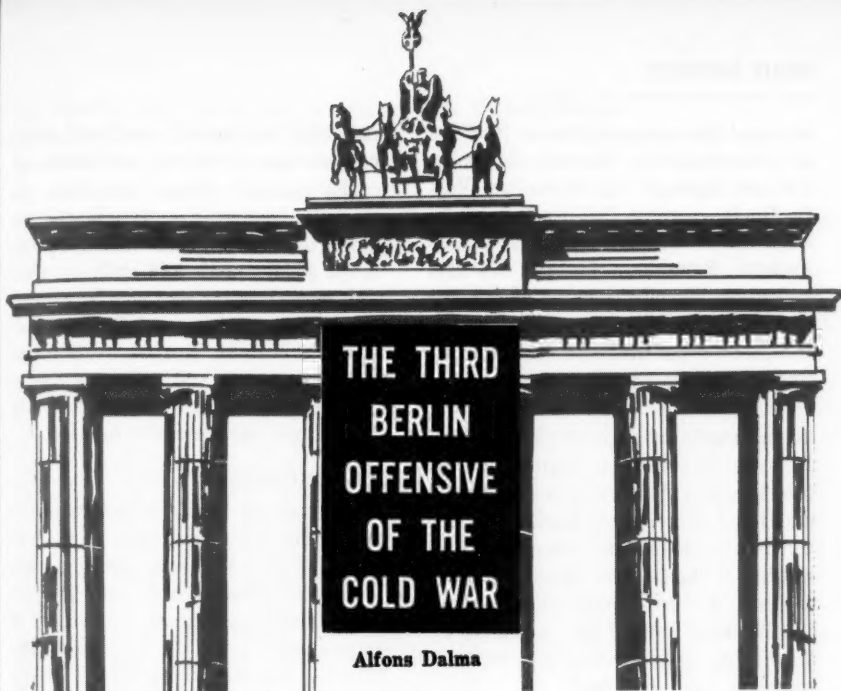
If I were charged with preparing a program, I would list these essentials. We need the simplest possible chain of command, and units must be dispersed far greater than they are now. The physical layout and dense concentrations of our headquarters overseas are outstanding examples of targets inviting disaster.

The same is true in the United States. In 1955 I covered the country from coast to coast. Last year I traveled more than 20,000 miles over the same territory and I could detect no appreciable change in the situation.

Digging is of the utmost importance. This applies to troops at the front, troops at the rear, and to civilians wherever they are located. To date, we have had too much talk and not enough action.

The situation throughout the Free World concerning defense against nuclear attack reminds me of Hiroshima in 1945—no dispersion, and wishful thinking that the allied nations are "open cities" not susceptible to enemy attack.

Major James A. Buck, United States Army, a Japanese linguist recently assigned to the US Army Intelligence School from Headquarters, 8th US Army, assisted in the interviews and collection of factual data for this article.
—Editor.



This article presents an analysis of the cold war problem of Berlin and what the situation portends for the future as seen by a mature and informed West German observer. Mr. Dalma emphasizes the interrelationship between military and political strategy as he presents the cycles through which the Soviets have passed in their efforts to dislodge the free nations of the West from their rightful position in West Berlin.

The author is the Editor in Chief of the Munchner Merkur, a lecturer in political strategy at the Academy for Political Science in Munich, and a frequent contributor to major professional journals. The viewpoints expressed here are those of the author and are not necessarily endorsed by the MILITARY REVIEW, the U. S. Army Command and General Staff College, or the United States Army.—Editor.

THE Soviet cold war offensive of 1961 against Berlin, Germany, and Western Europe is founded on the same basis as earlier crises in this area. It could be described as the second phase of the same operation. Added are perhaps the changes in the political and military power relation between East and West which have occurred in the meantime, and slightly modified and refined methods of cold war strategy.

The political and strategic planning of the Soviet Union stresses two cardinal points. First, the defensive position of West Berlin is militarily weak because of the outpost position of the

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city and the vulnerability of its lines of communication. Second, the political and strategic significance of West Berlin is so great that its loss would have an incalculable effect upon the Federal Republic, Western Europe, and upon the effectiveness of the entire Atlantic Alliance.

Moscow's political and strategic action in the Berlin crisis has two related objectives: The demonstration of the ineffectiveness of the Western Alliance by eventual capitulation of the Western Powers before the demands of Moscow on Berlin and the German problem, and the moral separation of the German people from the Western Powers which will follow if the Western Powers are forced to acknowledge the partitioning of Germany as legal and final.

Should this occur the Federal Republic would have to seek an arrangement directly with the Soviet Union. Within the equation of the power relation of East and West, the Federal Republic, the third industrial power in the world, is an important factor in military strength. Such a reorientation of West German policy would cause all of Western Europe to fall blindly into the Soviet sphere of influence. Soviet influence would become predominant.

Responsible political and military circles in the United States have recognized this goal for years. The attitude of the President shows that he knows a withdrawal of the United States from Berlin under pressure and compulsion would shake the credibility of the Western Alliance and destroy confidence in the American guaranty of protection. The Federal Republic would then be exposed to far more effective physical blackmail-

ing under unfavorable national, political, and psychological conditions.

The masses, whose memories are generally short, are frequently inclined to consider each crisis individually; governments and military planners must keep an eye on the general trends and the Soviets' German policy. In this light, Khrushchev's plain-spoken demands and generous assurances fall into true perspective. They are neither harmless nor modest.

The First Offensive

The current Berlin offensive is the third. The first two fell in 1948-49 and 1958-60. All three arose within Moscow's unified German policy which shows three phases over the span of 16 years. In each of the phases the purpose and trend of Soviet policy have remained the same.

During the first phase, from the Yalta Conference in 1944 until the end of the Berlin blockade in 1949, Moscow sought to take possession of Germany by taking advantage of the political oversights of the Western Powers. In her own occupation zone, the Soviet Union immediately began to liquidate the historically developed German society by establishing a Communist power machine and installing a Socialist economic system. In the Western zones she tried to prompt the trusting Americans to eliminate the national and conservative German elements, to split up the German forms of society, to introduce an economic system of extreme Socialist mold, and to let Communists (as reliable, anti-Fascist democrats) gain influence.

From today's perspective this phase of the Soviets' German policy appears fantastic if not surrealistic. Moscow almost achieved its goal in this phase of operations. The disadvantages of

the West's position in Berlin originated from the planned and farsighted moves of the Soviets as well as from the gullibility and the blind confidence of the Western Powers during the years of this first phase. Only in the fall of 1947 did the United States become disenchanted and alert.

The Berlin blockade of 1948 was a precipitate attempt of Moscow to ex-

The Second Offensive

The tactics of this phase operated in an environment of internal Western conflicts of opinion caused by the Federal Republic coming into existence as a potential rival of Great Britain and France. Moscow's method in that decade was primarily political and psychological enticement and tactical exploitation of the old forms of



US Army

Flourishing West Berlin, in the heart of a failing communistic economy, provides an unpalatable contrast to the Soviets

tort by force and blackmail what could no longer be obtained by trickery and ideological doubletalk. The Berlin blockade failed. The American monopoly in nuclear weapons was taken into account in the second phase of the Soviets' German policy. Moscow avoided drastic methods and binding threats of force. The monopoly gradually, however, changed into a mere American superiority.

national interests. Moscow turned to Great Britain and France portraying Germany, which had gradually regained her strength, as the resurrection of the old German danger.

Stalin and later Khrushchev dangled before the eyes of the Germans the prospects of reunification, of the reparation of the national catastrophe of 1945, under Soviet conditions. Even at that time a song was being softly

sung which is now being played to a new arrangement—the betrayal of the West for the cause of German unity.

Moscow's diverse methods had specific objectives—to prevent the integration of the Federal Republic in the Western defense system, to frustrate the recovery of Germany as a military factor, and to neutralize Germany, thereby exposing Europe to Soviet superiority and ultimately Soviet domination.

It is characteristic that this phase ends where a new relationship of strategic armament begins. After the Soviets had created thermonuclear weapons and a strong missile system and thus reached a military parity of sorts with the United States (a gradually increasing process during the period 1954-58), they shifted their German policy again from enticement and multiple-purpose deception to blackmailing, force, and pressure. "D"-day for the inception of this third phase, which very likely will reach its climax in the months to come, was 28 November 1958.

The Third Offensive—Objectives

To merely compel the West to recognize the partitioning of Germany under international law and to acknowledge the legality of the government of the Soviet zone is not the true objective of Operation *Berlin*. The risk to which the Soviet Union has exposed herself in the Berlin crisis, a risk which could involve a nuclear war, is not compatible with such a limited objective. But if the stakes are all of Germany and Western Europe as a whole then her readiness to take the risk becomes understandable.

The same observation holds true on the American side. The United States acceptance of the risk of general war, rather than accept the Soviet demands,

indicates that Washington knows that this is not a matter of fixing the *status quo* but that it is preparation for further dynamic expansion of the Soviet empire into the German and West European area. It would be absurd for the United States and the Federal Republic to risk a thermonuclear war solely to avoid *de facto* recognition of the Ulbricht regime. But it becomes logical when the security of Western Europe and the existence of the entire Western Alliance is in balance. Christian Herter expressed this in the summer of 1959 when he said:

The long-range objective of the Soviets is to maintain a divided Germany until the opportunity arises to create one single German state under Communist influence. Their Berlin proposal shall lead . . . to expedite the achievement of this goal. To go along with these proposals would involve a significant retreat on the part of the West from which the world would learn that the brutal strength of the Soviets is the ruling power in this part of Europe.

Khrushchev, in his Leipzig address of 7 March 1959, described a free city of Berlin as the best way for a transition into an all-Communist Berlin; and the theory of two German states as the best way for one Germany to be established through the battle of the classes with Walter Ulbricht as the chief of state and Otto Grotewohl as the chancellor of all Germany. And now, shortly after the resumption of his Berlin offensive with the alleged goal of permanently establishing a divided Germany, the Soviet Minister-President spoke before students of the Military Academy in the Kremlin about the necessity of German reunification. He urged that the Federal

Republic accept the proposal for a federation of German states and to come to an agreement with the government of the Soviet zone on reunification.

This was on 7 July of this year. Even the Vienna Memorandum of the Soviet Government of 3 July does not expressly reject the principle of future German reunification in spite of the pressing for the recognition of two "legal" German states.

Thus the dialectic of the Soviets' German policy ranges from the *de facto* division of Germany, forced and maintained by the Soviet Union through acknowledgment of the existence of two German sovereign states, to German unification under a Soviet system.

Military Factors

The third Berlin crisis of the post-war period, its political goals and the danger it involves, bears directly upon military considerations.

The relative military power of the East and the West is one of the motivating reasons for the political and strategic offensive by Moscow against Berlin. However, the course of the crisis will depend upon a series of defensive, political, and military measures taken by the East and the West and upon the credibility of these measures. In this sense the Berlin crisis is a test case for the entire military policy of a scaled deterrent strategy. Until the settlement of the crisis or until the termination of the conflict stemming therefrom, each political and military measure taken by either side will serve to increase confidence in the effectiveness of the deterrent strategy or to turn the conflict to the advantage of one opponent.

In view of the far-reaching worldwide interests and objectives which

are involved in the Berlin crisis, it is conceivable that a conflict, initially local, may develop into a large-scale operation expanding geographically and increasing in intensity as it develops. Because of the technological development of nuclear weapons it is also conceivable that the risk of increased intensity in an expanded conflict could become a strong factor in the efforts to contain it.

If the strategy of deterrence is to prevent the outbreak of an armed conflict, it obviously must be adapted to all degrees of the scale ranging from accidental military incidents to geographically limited small war with conventional arms, to a geographically limited nuclear war, or to an all-out war which would include the territories of the principal opponents and the entire war potential of the United States and the USSR.

The strategy of deterrence is effective when readiness for waging war and preparedness for any type and form of conflict that can be anticipated is so evident that in any imaginable case the chances for success appear to the potential aggressor smaller than the chances of defeat; the risk in any phase must obviously be greater than the expected advantages.

Politico-Military Interrelationships

The interrelated military and political nature of the Berlin crisis can be seen from the course of events. On the Soviet side the efforts to increase the credibility of their determination for military actions ranging from small conventional operations to thermonuclear war are obvious. On the American side most of the deterrent measures are relative either to an accelerated increase in the conventional arms potential or in demonstrating the readiness for thermonuclear warfare.

The demand made by General Maxwell D. Taylor years ago stressing the capability of the American and Allied Armed Forces to wage conventional and paraconventional war has become the official defense doctrine of the United States. But, as the strategy of scaled deterrence is a whole and only effective in its entirety, the preparations for limited conflicts at the conventional or paraconventional level do not preclude an increase in intensity of a conflict, nor do they make preparedness for such an increase unnecessary.

The containment of a conflict hinges upon the next higher step on the scale of deterrence. As Joseph Alsop said in the spring of 1961:

Ultimately everything depends upon a question which no statesman in history has as yet had to answer: Is the United States willing to bargain with a thermonuclear war in order to maintain her solemn obligations? This question has to be answered before we make all other conceivable and clear decisions on a valid defense of Berlin.

Deterrence and Determination

From the standpoint of deterrent strategy it is relatively simple to convince an opponent of the determination to wage offensive or defensive warfare in a limited geographical area with conventional arms, but it is extremely difficult to convince him of a readiness for intensified warfare reaching into the sphere of thermonuclear weapons.

The risk of a thermonuclear war with weapons known today is so great for both of the superpowers that political and strategic planning must take into account greater risk of a general nuclear war than would have been necessary a few years or even months ago. It follows that the critical

military element of the Berlin crisis lies in the unknown and hard to foresee medium ranges of the possible conflict.

There are so many possible eventualities in the medium range of conflict above the threshold of conventional and below the threshold of thermonuclear operations that the chances for a miscalculation are great. Undoubtedly, in the months to come it will be the task of the Western political leaders to form a strategy of deterrence in this area in a more convincing, more differentiating, and thus more effective mold.

Dangers in a Limited War

Two reasons force us to focus our attention upon the possibility of a war limited to the German or central European area—which because of alliances would expand to a general nuclear war—in order to seek effective deterrent measures against such a development. In his speech of 21 June Khrushchev threatened the Federal Republic. The speech was intended to intimidate, but, nevertheless, it compelled us to take notice that the chief of the Soviet Government toys with the idea of a devastating war limited to German soil.

In the catalog of considerations we must make room for the special temptation which arises for the Soviet planners when they perhaps, by putting too much trust in the remoteness of a direct Soviet-American thermonuclear war, calculate the advantages of a nuclear war limited to the German area which would very likely end in a draw. Even if, at the time of truce, today's territorial *status quo* were reestablished and on the surface no party were victorious in the conflict (as in Korea), in reality the Soviet Union would be the absolute win-

ner. In the big power equation, the insignificant Soviet zone would be on the Eastern side. On the Western side the essential, yes, even decisive, political, economic, and military factor of the Federal Republic would have, for all practical purposes, been destroyed. The Soviet Union would have achieved one of the major goals of her German policy: the elimination of the Federal Republic as an obstacle to Soviet expansion.

The prospect of such a gain for Soviet global strategy makes it probable that any attempt to attain it would simply compel the United States to increase the intensity of the conflict to a large-scale thermonuclear war. However, the danger rests in the fact that the Soviet leaders particularly, in this point, may be the victim of miscalculation. The Soviets try to convince themselves and the world that presently the USSR is ahead in regard to armament for an all-out thermonuclear war.

Military Deterrent to Limited War

Deterring measures which will convince the Soviet leadership that risks involved in a limited paranuclear conflict on German territory are greater than the expected advantages will have to be taken by the West if the dangers of a Soviet miscalculation are to be precluded.

Two categories are conceivable: purely military measures, and politico-strategic deterrent measures. One would be to assemble a strategic-nuclear retaliation capacity in case of the nuclear devastation of the Federal Republic by the Soviet armed forces. Moreover, it should be made clear to Moscow that the weakness of the inner structure and the military system of the Soviet zone is, in the event of a conflict, a potential danger to the

Soviet military forces, to the reliability of the entire satellite sphere, and to the worldwide prestige of the Soviet Union.

The technical prerequisites for a strategic nuclear potential by German armed forces exist today. The retaliation potential, however, is not in German but in American hands. For a deterrent purpose it would serve well to convince the Soviet leaders that in case of a conflict with nuclear weapons on German territory a nuclear retaliation potential would be placed at the disposal of German military leadership which:

1. Could inflict damage on Soviet territory equivalent to the devastations in the Federal Republic.

2. Could compel the Soviet Union to take the next step if she does not want to be at a power disadvantage with the United States which until that time would not have been touched.

The automatic increase and effectiveness of defense readiness to give credibility to the maintenance of all stages of scaled deterrent strategy is, in view of the Soviet goal, not only a means or method to settle the Berlin crisis. This maintenance is, as matters stand, a substantial political problem raised by the crisis. The crisis is polyvalent. Moscow can strive alternately for a new status of Berlin and recognition of the Ulbricht regime, or a ban of nuclear arms and warheads at the periphery of NATO, especially the Federal Republic.

It is conceivable, and there are many indications, that Khrushchev would back down from essential demands in regard to the Berlin dispute and the German problem if the Western Powers would concede a zone in central Europe in which nuclear weapons are banned.

BERLIN OFFENSIVE

This would be victory of nearly historical significance for the Soviet Union. The Federal Republic then would be excluded from the area protected by the nuclear deterrent. The Germans and the German armed forces would lose confidence in the alliance and in the United States through such a decision.

These are precisely the two objectives of the Soviets' German policy in

internal weakness of the Ulbricht regime. The Soviets seem to know and events reveal daily that the entire populace of East Germany is in a state of permanent, although latent, resistance against the Soviet rulers and their German executors.

Already the danger of war, evoked by the Soviets, has had a galvanizing effect upon the discontent of the Germans in the Soviet zone. It would be



Defense Minister of the
German Federal Republic

West German troops prepare an *Honest John* launcher for action

general and the policy in the Berlin crisis in particular; that is, to declare the protection of the alliance an evident failure and to bring about the moral separation of Germany and the United States.

Political Deterrent to Limited War

A second effective means of Western deterrent strategy would result from a systematic exploitation of the

possible to convince the Soviets through stronger propaganda and frequent hints on diplomatic levels that in the event of war the passive resistance, especially between the Elbe and Oder, would increase to a total resistance, and would lead to a general revolt of the people and the collapse of the administrative police and military machine in the Soviet zone.

The strategy of deterrence of the

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West would become clearer, more convincing, more credible, and more effective through military, politico-strategic, and economic precautionary measures of this kind.

In summarizing the analysis of the political objective and the politico-defense background of the current Berlin crisis, the appraisal of the situation shows that the Soviet Union strives to increase the credibility of her military threats and that the West is building up the credibility of their deterrent defense in readiness for all foreseeable possibilities. Each practi-

cal oversight of the theoretical necessities of a complete scaled deterrent strategy could be fateful and could channel the course of the crisis to a military conflict.

In the normal course of events and with uninterrupted functioning of the deterrent strategy, the crisis may end in the course of time without a change in the *status quo* by running aground in endless as well as futile negotiations; however, the different phases of negotiations would have to be accompanied by corresponding measures of defense readiness.

If there is a dangerous crisis in Berlin—and there is—it is because of threats against the vital interests and the deep commitments of the Western Powers and the freedom of West Berlin. We cannot yield these interests. We cannot fail these commitments. We cannot surrender the freedom of these people for whom we are responsible. A 'peace treaty' which carried with it the provisions which destroy the peace would be a fraud. A 'free city' which was not genuinely free would suffocate freedom and would be an infamy. . . .

* * * * *

The Western Powers have calmly resolved to defend, by whatever means are forced upon them, their obligations and their access to the free citizens of West Berlin and the self-determination of those citizens. This generation learned from bitter experience that either brandishing or yielding to threats can only lead to war. But firmness and reason can lead to the kind of peaceful solution in which my country profoundly believes. . . .

President John F. Kennedy

DEFENSE OF THE BRITISH COMMON- WEALTH

**IN NORTH AMERICA
AND EUROPE**

Harald Husemann

Changes in power ratios and factors of economic interdependence undoubtedly affect the historic function of the British Commonwealth of Nations as a unifying and stabilizing influence within the Free World. This article discusses the elements of the British Commonwealth association which bear directly on the North Atlantic Alliance. A subsequent article to be published in the January 1962 issue will extend this discussion to the members of the Commonwealth in the Asiatic and Pacific areas.—Editor.

THE British Commonwealth, today, is a free association of sovereign states and of territories dependent upon them. There is no central organ



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for these states, each nation being responsible for its own domestic and foreign policies. However, in regard to matters of common interest, there is close contact between the individual governments through correspondence, exchange of High Commissioners, conferences of ministers, and a network of common commissions.

There is also no central defense or defense planning in this very loose alliance—a fact which raises several questions: To what extent does national defense of the individual countries exist under the aspect of a common Commonwealth defense? To what extent are the defense efforts of the individual countries determined by a pact system rather than by the Commonwealth? What other defense prob-

lems do the Commonwealth nations have outside their Commonwealth and pact obligations?

The defense policy of the Commonwealth countries is determined by their geographical position, their history, their military-industrial potential, and their foreign policy. With these factors in mind, the Imperial Conference of 1937 made a defense resolution which outlined four requirements: security and integrity of the empire, security of sea and air communications, dominion parliamentary decisions as to military actions, and individual dominion self-defense until reinforced. This resolution also pointed out that the main burden of defense was on England as the strategic heart of the Commonwealth.

This conference, aware of Hitler's and Mussolini's underlying intentions, expressed specific interest in the security of the Pacific Ocean. Special reference was made to the international obligations of the individual countries, and to standardizing military equipment, training, and administration in the various parts of the empire. Cooperation in weapon development, common protection of sea routes, and establishment of common airbases were recommended.

Prewar Cooperation

Before World War II major instruments for military cooperation included consultation at the Imperial Conferences, correspondence between the Defense Ministers, and consulta-

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DEFENSE OF THE COMMONWEALTH

tions with experts assigned to the High Commissioners in London. There was also cooperation within the Imperial Defense College in London, founded in 1927 and attended by officers from all Commonwealth countries. A final instrument of cooperation was the Committee of Imperial Defense, established in 1904.

Although in World War II no Imperial War Cabinet was formed, the armed forces of the Commonwealth members operated jointly. Taking part in joint actions were "Visiting Forces" in which the troops of the individual countries operated under their own commander, and "Combined Forces" in which the troops operated under a joint high command. After the Japanese attack on Pearl Harbor in December 1941, the United States considered the Commonwealth as a union and negotiated with London on joint actions.

Postwar Policy

Postwar defense planning for the Commonwealth became known from a report which Prime Minister Chiefley made to the Australian Parliament. According to this report four conditions had been decided upon as indispensable for the security of the Commonwealth: Commonwealth troops were to be placed at the disposal of the United Nations for the maintenance of peace. There should be cooperation among the armed forces of the Commonwealth members, in accordance with Article 51 of the United Nations Charter on the right of collective self-defense. Armed forces of each Commonwealth member should be organized for self-defense. Cooperation in the Commonwealth defense, finally, should exist without violating the sovereign policies of the members.

In later statements, Chiefley set

forth a decisive development of Commonwealth defense—a trend toward regional responsibility. He welcomed the establishment of American bases on Australian soil as part of an all-embracing defense plan for the Pacific. England, he observed, had lost enough riches and blood in defense of the Commonwealth; Australia, in the future, would make a larger contribution to defense especially in the Pacific.

Proposals for Defense

Chiefley reported further English proposals: Each member of the Commonwealth should assume responsibility for defending its own territory and adjacent strategic zones, while sharing a common responsibility for the security of communication routes. For strategic reasons, the population within the Commonwealth should be distributed more evenly, by means of an easier migration procedure. The dominions should organize troop training in such a manner as to enable rapid expansion in case of war. The dominions, finally, should work closer together in defense research and establish common information bureaus.

The prewar agencies for military consultation and cooperation continued in existence after the war. Exchange of weapons, troops, training personnel, and research results was increased, and joint maneuvers were held. As most Commonwealth members have continued to purchase heavy weapons—war vessels, aircraft, tanks, and rocket weapons—from England or to build them according to English blueprints, there has been an extensive standardization of weapons.

In February 1952 England, Canada, and the United States made an agreement to build and equip jointly the *Sabre* aircraft. In March 1952 the

Australian Government approved adoption of English standards for weapons and equipment. England and Canada have adopted the Belgian FN rifle recommended by NATO, and Canada procures *Centurion* tanks from England.

Ships and Aircraft

Jet aircraft manufactured in Australia have English *Adder* and *Viper* turbojet motors, and Australia builds

gades of the division were comprised of troops from England, Canada, Australia, and New Zealand, with one Indian medical unit. Ships and aircraft of the Royal Navy and warships from Canada, Australia, New Zealand, and South Africa were also assigned an active part. The Commonwealth troop contingent in Korea was at times 33,000 men, of whom 20,000 were in the Commonwealth division. Of these,



Canadian National Defense

Canadian *Centurion* tanks, product of British-Canadian cooperation

English gas turbine motors for the Australian *Canberra* bombers and *Sabre* fighter planes. In 1955 the Australian Naval Air Force was equipped with English fighter aircraft. New Zealand in 1950 and 1952 received war vessels from England and Australia.

In July 1951 the members of the Commonwealth provided one Commonwealth division under UN command for operations in Korea. The three bri-

England contributed 20,000, Canada 8,000, Australia 2,500, and New Zealand 2,000.

After the truce of Panmunjom in 1953 India especially assisted in the repatriation of Prisoners of War. The chairman of the Repatriation Commission was an Indian.

Cooperation in military research, especially nuclear research, among Commonwealth and other nations began in November 1945 with the con-

DEFENSE OF THE COMMONWEALTH

ference of Truman, Mackenzie King, and Attlee on joint control of atomic energy. Their final communiqué of 15 November stated that the signatory states saw cause to recommend international control, and were willing to share results of research, subject to effective international safeguards

ons; the first test with bombs of this type was made in 1957 on Christmas Island in the Pacific.

The "Declaration of Common Purpose" signed on 25 October 1957 by President Eisenhower and Prime Minister Macmillan was followed by Eisenhower's recommendation to the



British Information Services
British mortar crews of the Commonwealth Division supporting US troops during an assault on an enemy outpost in Korea

against military misuse of nuclear energy.

As the exchange of United States nuclear information initially was prohibited by law, England was compelled to make efforts on her own in this field. The first test explosion of an atomic bomb on the Monte Bello Islands took place in 1952, and issue of nuclear weapons to troops began in 1954. In 1955 the English Government resolved to make thermonuclear weap-

American Congress to revise the "Atomic Energy Act" and to permit the exchange of information. Thereupon, on 2 July 1958, a treaty between England and the United States was signed.

The treaty provided for cooperation in defense planning, and in training personnel in the employment of and defense against nuclear weapons. It provided for joint consultation on the nuclear armament of potential ene-

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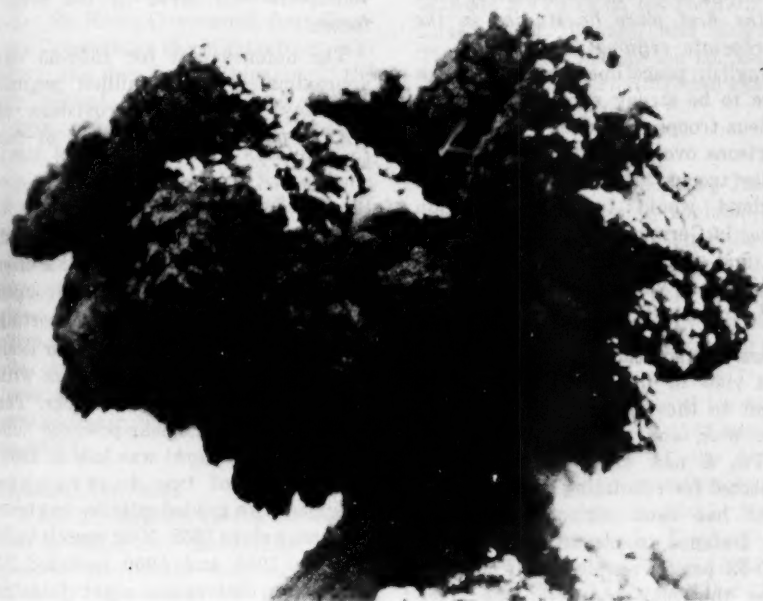
mies, and for research and planning of military reactors. Finally, it proposed delivery from the US to England of a complete nuclear propulsion unit for a submarine, as well as enriched uranium and construction plans. The treaty made no provisions for the delivery of atomic weapons and the exchange of information was only to serve defense purposes.

In April 1946 a Commonwealth Advisory Committee on Defense Science

Minister's proposal to test long-range weapons jointly with England in Australia. In April 1948 the Australian Parliament announced that England planned to set up in south Australia the major Commonwealth proving ground for supersonic air defense rockets.

England, the Commonwealth, and NATO

In spite of the trend toward dominion responsibility, England remains the principal carrier of the



British Information Services

Britain's first atomic weapon was detonated on the Monte Bello Islands, Australia, on 3 October 1952

was founded. During a conference in November 1947 it was resolved that such conferences would be held successively in all Commonwealth countries. The major activity of this committee was consultation on guided weapons. Later in the year the Australian Parliament approved the Defense

Commonwealth defense because of her responsibilities for the defense of the still dependent territories and her obligations within the North Atlantic Treaty Organization and the Southeast Asia Treaty Organization.

Under the terms of a 1949 white paper, cooperation within the Com-

monwealth would still be governed by the principles of the Statute of Westminster and the requirements of regional defense:

The natural starting point for future progress in Commonwealth defense has been the idea of regional association. . . . Geography largely decides which problems most directly concern the separate members of the Commonwealth, and it is the aim of the various governments to recognize and take advantage of this fact by arranging that regional questions shall in the first place be studied in the appropriate regional center.

English peacetime armed forces were to be strong enough to provide nucleus troops in case of war, to form garrisons overseas, and to commit security troops to the United Nations. England would furnish occupation forces in Germany, Austria, and Trieste, and would assist in the Berlin Airlift along with Australia, New Zealand, and South Africa.

Postwar Rearmament

In view of increasing tensions incident to the Berlin Airlift, the Korean War, and the establishment of NATO, a new three-year plan was projected for rebuilding the armament which had been neglected after the war. Defense expenditures during the 1950-53 period were actually doubled under this plan but after the truce in Korea armament programs again slowed down.

In consideration of England's economic difficulties, the development of new weapons, and England's integration into NATO, the English Government published a 1957 white paper, "Defense: Outline of Future Policy," which set forth a new five-year plan entailing big changes. Major tasks of this reorganization were to be co-

operation with the allies in resisting and deterring aggression, and defense of the British colonies by limited operations in overseas emergencies.

To accomplish these tasks, small, mobile, modern units were to be formed, equipped with deterrent nuclear weapons, among others. A central strategic reserve was to be maintained, and the facilities for air transport expanded so that these reserves could be moved swiftly to any trouble spot. By the end of 1962 only volunteers will serve in the armed forces.

The defense cost for 1959-60 was approximately 1,514 million pounds. Germany, under the provisions of NATO, paid about 12 million of this amount.

The New Royal Navy

The Royal Navy, by the new plan, will be a small but very flexible fleet centered on aircraft carriers. Grouped around the carriers will be supporting ships with the latest weapons for dealing with air assaults as well as with surface and underwater attacks. The keel of the first nuclear-powered submarine *Dreadnought* was laid in 1959. Construction of two destroyers equipped with guided missiles has been underway since 1959. New vessels built between 1956 and 1960 included 24 submarine destroyers, eight frigates for air defense, and 13 submarines.

The vessels committed to NATO are equipped primarily for submarine defense. The Far East Fleet, headquartered at Singapore, is able to deal with any kind of operation. Economy measures closed down the shipbuilding yards of Hong Kong and Malta; however, the shipbuilding yards in Singapore and Gibraltar continue to be important.

Army and Air Force Developments

In the army, armament emphasis has been placed on air-transportable weapons. By 1960 half of the army was equipped with the Belgian *FN* rifle recommended by NATO. One of the two regiments equipped with American *Corporal* missiles is deployed with the Army of the Rhine in Germany. Between 1958 and 1960 troop strength declined in Europe from 282,000 to 243,000, and in other overseas areas from 86,000 to 62,000.

The Royal Air Force comprises, besides the Home Commands, four Overseas Commands: the Middle East (Cyprus), the Far East (Singapore), the 2d Tactical (Germany), and British Forces, Arabian Peninsula. The air force is equipped with *Valiant*, *Vulcan*, and *Victor* bombers. Air defense is supported by a chain of radar stations distributed all over England.

England's first station for missile training and missile tests has existed since 1958 in North Coates, Lincolnshire. *Fireflash* and *Firestreak* missiles are available for air-to-air defense and the *Bloodhound* missile for ground-to-air defense (MR, Dec 1960, pp 68-72).

Dependent Territories

While cooperation among the dominions is voluntary, the defense of dependent territories and colonies is England's responsibility. In addition to the naval bases in Gibraltar, Malta, Singapore, Aden, Hong Kong, Free-town, and Bermuda, there are airbases in Gibraltar, Malta, Cyprus, Aden, Nairobi, Singapore, and Hong Kong. England maintains garrisons in Jamaica, British Honduras, Gibraltar, Malta, Cyprus, Aden, Singapore, and Hong Kong. East Africa, Mauritius, Singapore, Malaya, Hong Kong, and the Fiji Islands maintain their own

troops. Officers of the colonial troops are generally trained at English military academies.

England's obligations in NATO are clearly defined by treaty. The forerunners of this treaty (signed on 4 April 1949 in Washington) included the Anglo-French Treaty of 4 March 1947 on mutual aid in the event of German aggression (Dunkerque Treaty).

Another antecedent agreement was the Brussels Treaty of 17 March 1948 between Belgium, the Netherlands, Luxembourg, France, and England. This treaty as well as the Dunkerque Treaty was primarily directed against a German aggression.

Founding of NATO

The American Vandenburg Resolution of 1948, stressing regional, collective self-defense, initiated the formation of the North Atlantic Defense Community on 4 April 1949. In NATO, England functions as a link between the economically most powerful NATO partners, Canada and the United States, and as a springboard for America to the Continent. In 1956 approximately 15,000 men of the United States Air Force were stationed at 18 airfields in England. Many NATO command posts are in England—the Channel Committee (CHANCOM), the Allied Commander in Chief Channel (CINCHAN), the Allied Maritime Air Commander in Chief Channel, and the NATO Commander in Chief and Air Force Commander in Chief East Atlantic.

About 40 of the 100 Royal Air Force squadrons are under NATO command. Most of these 40 squadrons make up the "2d Tactical Air Fleet" which is the core of the "2d Allied Tactical Air Force" in Germany.

Tasks of the Fleet

The task of the English Fleet within NATO is especially the defense of the Mediterranean, the Atlantic, the arctic seas, and the coastal waters. As England's contribution is primarily submarine defense, England should, within the framework of NATO, also get nuclear submarines armed with American *Polaris* missiles for submarine defense. In November 1958 it became known that arrangements had been made for an Anglo-American corporation to manufacture the *Polaris* missile in joint production.

Besides the 2d Tactical Air Fleet, England maintains the Army of the Rhine in Germany as a defense contribution. With reference to the three-year plan of 1957, the defense white paper of 1958 stated that England could not maintain troops in Germany at present strength without financial aid. England and Germany thereupon agreed that Germany should pay 12 million pounds in each of the Fiscal Years 1958-59, 1959-60, and 1960-61. Germany would deposit without receiving interest 50 million pounds for weapon purchases in England. In 1958-59 Germany would pay 22.5 million pounds of war debts which were not to become due until 1962-64.

England, in turn, was prepared to leave in Germany a minimum of 55,000 troops in 1958 and 45,000 in 1960-61. The 2d Tactical Air Fleet would remain at its present strength until 1960-61.

Canada

Next to England, Canada is the Commonwealth member with the largest industrial potential. At the same time she is, like the United States, one of the most important members of NATO. While her geographical position facilitates a close cooperation

with the US, the development of her internal defense policy resembles that of England.

After the war Canada again established the post of Defense Minister. The Defense Council for coordinating the three branches of service was re-instituted in 1947 after it had been temporarily dissolved. A "National Defense Headquarters" was established with the Defense Ministry. The three Chiefs of Staff and the chairman of the Defense Research Board make up the Chiefs of Staff Committee which performs preliminary work for the Defense Committee of the Cabinet.

Close military cooperation between Canada and the United States began with the mutual tariff agreement in 1935 by which Canada retreated from the Commonwealth Customs System established in 1932. This tariff agreement was followed in 1938 by Roosevelt's promise to protect Canada against external aggression. This promise was strengthened by the Ogdensburg Agreement of 1938 which created a Permanent Joint Board of Defense:

It has been agreed that a Permanent Joint Board of Defense shall commence immediate studies relating to sea, land, and air problems including personnel and material. It will consider in the broad sense the defense of the north half of the Western Hemisphere.

This agreement was supplemented by the Hyde Park Declaration of 1941, which in essence provided for mutual procurement of war materials. During the war the United States built bases and pipelines in Canada. In 1942 an agreement was reached on the construction of the Alaska Highway which was to be built by the United

States. The Canadian section of the highway was to be turned over to Canada in peacetime. This highway, built for strategic reasons, led to an even closer cultural contact between the two countries.

Canadian-US Cooperation

In the postwar period the two governments agreed upon continued cooperation, the goals of which were announced by the Canadian Prime Minister Mackenzie King on 12 February 1947: There would be, he said, exchange of individual persons for the purpose of gaining knowledge about organizations in the other country, including exchange of observers during military exercises and tests. There would be joint planning and standardization of weapons, equipment, organization, and training methods. Each country, finally, would provide the other with sea and airbases.

Mackenzie King further stated that cooperation with the United States should be continued on the principles of the Joint Board on Defense. At that time there were no agreements obligating cooperation over an extended period of time. But, he continued:

The principles of cooperation announced . . . parallel closely the procedures which have long been applied between the nations of the British Commonwealth. . . . Measures of cooperation should be undertaken both with the United States and the United Kingdom.

In March 1949 the construction of the US-Canadian radar warning system around North America was announced, and in April 1949 a joint US-Canada Industrial Mobilization Committee was established.

Canada and the United States agreed in 1951 to establish a joint

headquarters and integrated defense control. Within the framework of the agreement the North American Air Defense Command (NORAD) was established, in 1957, with headquarters in Colorado Springs, Colorado.

The Commander in Chief of NORAD is responsible to the Chiefs of Staff of both countries. He submits to them proposals on joint air defense matters which are then worked out by their governments. The Commander in Chief operates under a plan approved by both governments, and has operational control of the forces under his command. The NORAD agreement is to be in force 10 years or less, depending upon future consultations by the two countries.

The two countries maintain jointly under NORAD command a net of radar warning systems which covers the whole North American Continent. This includes flying radar stations in the Atlantic, Arctic, and Pacific area, and the Distant Early Warning (DEW) Line constructed by the United States between Alaska and Greenland.

Another element is a chain of radar stations along the 55th degree of latitude which was jointly planned but built, financed, and operated by Canada. The Pinetree System is a joint project of both countries for the employment of interceptors under NORAD.

Provisions for Canadian-American cooperation outside NORAD were made by a 1958 agreement which set up the Canada-United States Committee on Joint Defense. The committee has only a supervisory function and does not supplant any other board or committee.

Canada in NATO

Both the United States and Canada joined NATO in 1949. Defense plan-

DEFENSE OF THE COMMONWEALTH

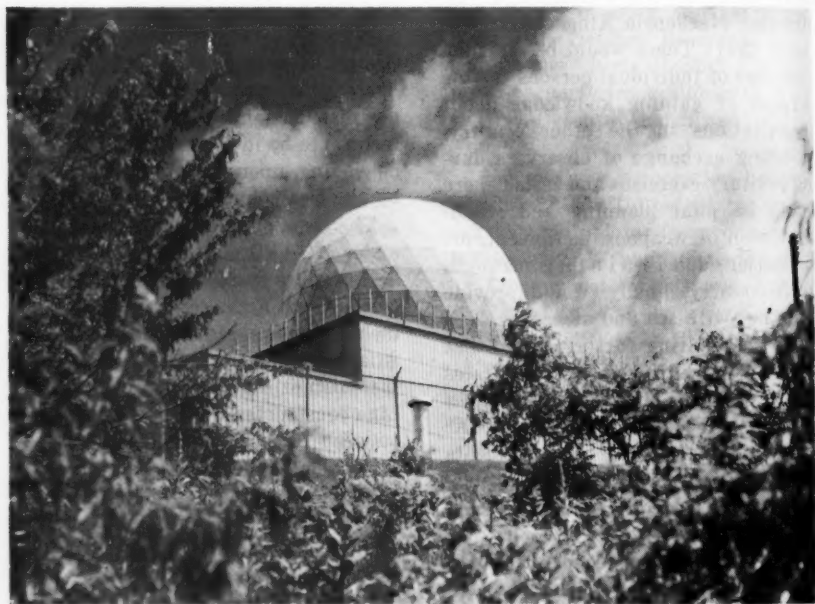
ning is the responsibility of the Canada-United States Regional Planning Group, with headquarters in Washington and Ottawa.

Canadian troops committed to NATO are under two joint commands: Supreme Allied Commander Europe (SACEUR), and Supreme Allied Commander Atlantic (SACLANT).

Canada is important to the other NATO countries, especially because of

5,575 pilots and navigators from 10 countries had been trained.

The first elements of equipment transferred to other countries were chiefly weapons, equipment, and ammunition for three European infantry divisions—one in Belgium, one in the Netherlands, and one in Italy. In later phases, 500 *F-86 Sabre* jets were delivered in Europe. In 1957 and 1958 Turkey received five coastal escort



Canadian National Defense

Canadian radar dome guarding the frontiers of North America against aerial invaders

the Mutual Aid Program which commenced in 1950. This program had a forerunner, the wartime British Commonwealth Air Training Agreement, under which 130,000 Commonwealth soldiers, as well as Frenchmen, Norwegians, and Poles, were trained in Canada.

Training of NATO aircrews began in 1951. By the time the training camps were closed in 1958 a total of

vessels and five coastal minesweepers, and 22 *Silver Star* jet training craft in 1959.

Canadian NATO Troops

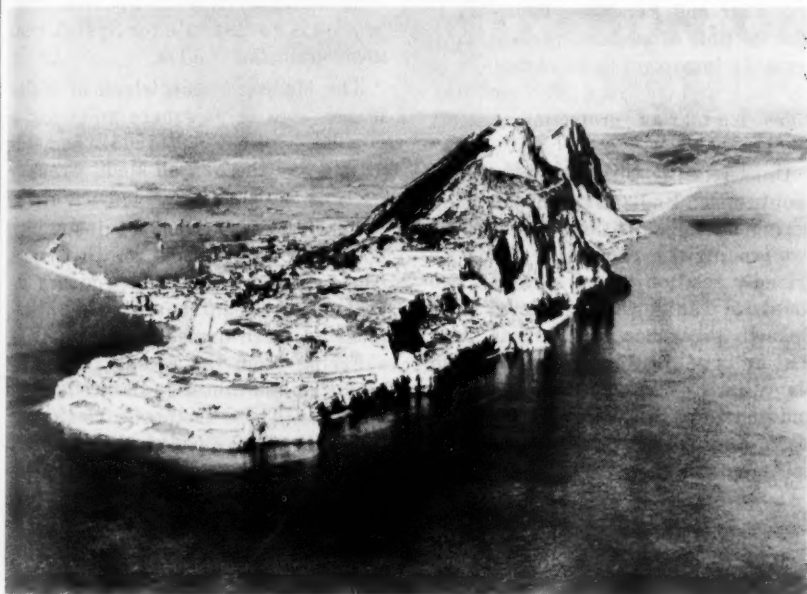
Canada's direct troop contribution to NATO consists of an infantry brigade group stationed in Westphalia, Germany. Canada's contribution to European air defense is eight squadrons of *F-86 Mark 6* interceptors and four squadrons of *CF-100 Mark 4B*

all-weather interceptors stationed in France and Germany. These represent 300 aircraft and 8,000 men, and make up the 1st Canadian Air Division.

Canada maintains under NORAD eight squadrons of CF-100 jets in east Canada and one squadron in west Canada. The Royal Canadian Air Force has a total of 39 squadrons in service.

In 1958 the Canadian Navy had 52 ships in commission and 28 in re-

Even though NATO is primarily a military alliance, Canadians—especially former Minister Lester Pearson—have tried to extend this treaty beyond the military concept. Pearson observed when the NATO Treaty was signed, "This treaty must, although it was born out of fear and disappointment, bring positive social, economic, and political success." Later, the NATO Council appointed a Pearson Committee. Its task was to investigate



British Information Services

Gibraltar, the Commonwealth guard post at the entrance to the Mediterranean

serve, as well as approximately 150 naval aircraft. All destroyers were being rearmed, equipped with antisubmarine weapons, and reclassified as fleet escorts. The largest part, 47 ships, of the Canadian Fleet is under the control of SACLANC and primarily equipped for submarine defense. In 25 universities, naval training divisions provide training for students.

the potentialities of NATO Treaty Article 2, which mentions stabilizing free institutions of the pact states by economic collaboration.

Canadian Prime Minister Mackenzie King, as early as 1944, stated that a balance among the four powers, the United States, the Soviet Union, China, and the Commonwealth, was not a guarantee for peace, and that

only an international system of peace-loving states would provide such a guarantee.

Gibraltar and Malta

Of extreme importance within NATO, especially for Commonwealth defense, is Gibraltar. It covers 2.5 square miles and has a population of 23,000. In 1957, a total of 8,566 vessels with a net tonnage of 10 million entered and cleared the port. Situated on the important sea route to the Near and Far East, Gibraltar is also, in time of modern warfare, strategically important as an airbase, supply base, and dockyard. The rock provides natural protection against modern weapons.

Until recently this area was a sore spot between England and Spain, hampering friendly relations between the two countries. However, a more friendly relation between the two countries can now be detected. The Spanish press has reported, in fact, that units of the Spanish and English Navy have held joint fleet exercises, and that English Air Force units from Malta have participated in rescue maneuvers with the Spanish Air Force.

Geography has made us [Canada and the United States] neighbors. History has made us friends. Economics has made us partners. And necessity has made us allies. Those whom nature hath so joined together, let no man put asunder.

What unites us is far greater than what divides us. The issues and irritants that inevitably affect all neighbors are small indeed in comparison with the issues that we face together—above all the somber threat now posed to the whole neighborhood of this continent—in fact, to the whole community of nations. But our alliance is born not of fear but of hope. It is an alliance that advances what we are for as well as opposes what we are against. . . .

Ours is the unity of equal and independent nations, cotenants of the same continent, heirs of the same legacy, and fully sovereign associates in the same historic endeavor: to preserve freedom for ourselves and all who wish it.

This change is largely due to the fact that the Spanish-American Fleet base Rota in the Bay of Cádiz has usurped Gibraltar's predominant position, and that Spain has acquired a military responsibility in this area by her participation in the American project. The strategic triangle of Rota, Gibraltar, and Ceuta which covers the narrow strait is of value only if there is joint planning and readiness. From the NATO point of view, the beginning of active English-Spanish cooperation is a substitute for Spain's non-membership in NATO.

The Mediterranean island of Malta has an area of 94 square miles and a population of 306,000 (1948). As headquarters of the British Mediterranean Fleet it is of strategic importance.

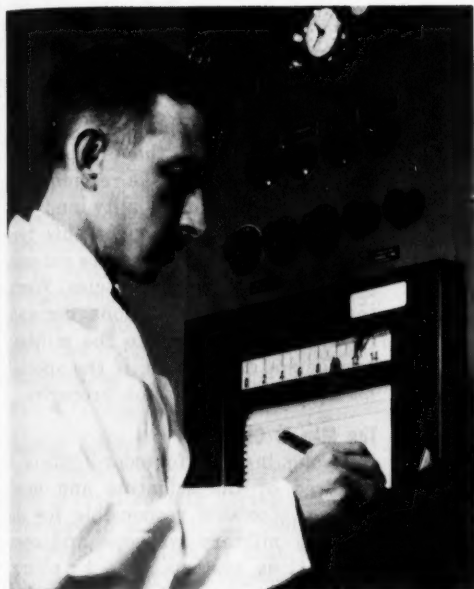
Political and economic instability poses special problems for this small island. Its suit for independence or representation in the British Parliament has been denied. Its economy is suffering from the recent closing of major United States and British naval facilities. These factors leave the future status of this historic outpost obscure.

President John F. Kennedy

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EFFECT OF SPECIAL- IZATION ON LEADERSHIP

Major Herbert A. Schulke, Jr.,
United States Army

CONCEPTS and equipment are evolving out of the Army's combat development and research and development systems that demand increased numbers of specialists in the officer and enlisted ranks. Meeting these demands over the past decade has resulted in hundreds of officers following graduate courses of study in civil colleges and universities. In the coming years many of our senior officers probably will be selected from this group, technical specialists by virtue of training and recurring assignments in their specialties.

Military history reveals how a nation's disregard of technological breakthroughs invites disaster. If disregard doesn't actually bring disaster, at the very least it places the nation at a serious disadvantage in dealing with countries whose leaders correctly evaluate the importance of technological achievement.

In the future it will be essential that this Nation's military leadership at the policymaking level include a higher proportion of men with a technical background and experience—men who understand highly technical proposals and recognize their military application.

The climate and pattern of leadership development and practice for specialists does not coincide with the climate and patterns prevailing for officers of the generalist category. Therefore, the climate and patterns for technical specialists should be examined to see what particular attributes of leadership are developed.

Science and engineering are concerned with the laws of nature governing physical behavior. Both study and application in these fields involve experimental work, the results of which are used by others for application or further experimentation. The

reliance placed on the published results of a scientist's research requires complete intellectual honesty and candor on his part. He must face, use, and report facts as they are and not as he would like them to be. Side effects, good or bad, must be explored, discerned, and pointed out.

He is never content with merely establishing the necessary conditions for a hypothesis, but always seeks to prove their sufficiency. Scientific progress is made only in an atmosphere of intellectual integrity. As an individual laboring in this intellectual atmosphere, and as a contributor to this progress, the scientific and engineering specialist normally responds by developing a high degree of integrity.

Feeling of Confidence

Loyalty is essential to the creative atmosphere wherein the scientific and engineering specialist acts in a supervisory or managerial position. He engenders a feeling of confidence in his subordinates by recognizing and crediting their outstanding achievements. Their creative output is a direct measure of his ability to create and maintain this feeling. The specialist's tendency to be "fact-minded" causes him to present to his superiors information they *ought* to know rather than what he thinks they would *like* to hear. This type of loyalty produces the freedom and latitude of operation

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necessary to exploit the creative atmosphere.

Incident to most utilization assignments for a technical specialist is the requirement to evaluate the work of agencies selling to the Military Establishment and to make recommendations regarding its quality and continuation. In a position of this type he may be subjected to severe external pressures from some agencies. Working under these conditions demands the utmost in loyalty to the military service and the Nation, if the specialist is to perform his job properly.

The Man in Charge

Strong instinct for coordination is required of the scientific and engineering specialist responsible for developing military weapons and communications systems. The typical specialist, contrary to popular view, is not the man who draws the schematic diagrams or solders the connections. Rather, he is the specialist-trained military manager—the man in charge. He brings together divergencies of technical requirements among using agencies. He determines the specifications and standards of performance that will ensure unity of effort among the variety of productive enterprises involved. He manages the administrative and fiscal details incident to the development, testing, and production of a particular system. Clearly, such a complex task requires detailed coordination within and between military services, civilian contractors, and even allied nations.

These and other activities of the specialist are all characterized by the necessity for exercising sound judgment. He becomes familiar with the project-type organization which puts together all the skills and means necessary to solve a problem. As a by-

product, the familiarity thus gained develops the type of judgment required in handling the complexities of modern, military, task force-type organizations.

Further, the continual need to be able to accept new ideas causes the specialist to exercise restraint in his expression of critical judgment. Control of critical judgment is vital to the fostering of creative effort. The exercise of good judgment by a specialist also indicates that he possesses resourcefulness, imagination, and vision.

Reasoning Ability

A scientific and engineering specialist is credited with having detailed knowledge in a particular field. What most people overlook is that this is but one facet of his knowledge. To this specialty must be added military knowledge built on previous schooling and experiences. This detailed military knowledge permits the specialist to translate effectively the technical facts of life of his specialty into *usable* and *reliable* military concepts and equipment.

But knowledge alone is sterile. A measure of creativity is required. Creativity often is described as applied knowledge. The degree to which the specialist nurtures or exhibits creativity is an excellent means of evaluating his knowledge.

In the process of acquiring a scientific specialty the candidate develops and learns to apply a high degree of reasoning ability. A broad range of knowledge and experience is essential to this ability. Furthermore, knowledge is most effective when it can be communicated. Beginning with the laboratory reports and theses required in graduate training, the specialist develops skill in communicat-

ing his acquired knowledge. He refines and improves his communications skill in the practice of his specialty through the reports he produces. The facility he develops in expressing the complex, technical aspects of his knowledge in easily understood terms is particularly important.

Analytical Ability

Another skill the technical specialist acquires in the course of his training and its application is analytical ability. The collection of facts characterizes all of his experimental and developmental work. To make his facts useful he analyzes them and draws a conclusion. The conclusion may be either the basis for the next phase of his work or the end result itself. The collection, analysis, and conclusion process continuously unfolds in military research and development.

If we regard technological progress as the major element of strife on the cold war battlefield—as our opponents do—we can understand how the stresses of technological combat constantly test the specialist's decision-making ability. Manpower and fiscal limitations alone call for decisions that quickly recognize and rapidly eliminate unproductive methods of approach.

To what does all of this point? Simply that the specialist has a stress-tested decision-making capability that could never have been developed if that individual had not had a high degree of moral courage.

Frequently, the technical specialist must work in laboratories that are staffed primarily by civilians. Here, shorn of many of his normal command prerogatives and disciplinary powers, he discharges the responsibilities of his command through the strength of

SPECIALIZATION

his personality, technical ability, and understanding of the people who work for him. Since most new ideas arise through the effective management of people, the specialist, acting as a manager, must create an environment conducive to the production of ideas. Applying his dual military and technical qualifications, he functions as both coach and advisor to his staff, thus promoting the team spirit essential to productive research.

The protracted time between concept and finished product teaches the specialist how to measure intangible productivity. Perhaps in no other field of endeavor is there a greater need for human understanding than in military leadership that has as its goal the creation of new ideas.

The climate of leadership for the technical specialist differs from that in which the generalist operates. Yet the qualities of leadership develop in both climates. In many cases, the spe-

cialist's leadership skills were essential to his pursuit of professional training. The tangible results of his work provide data for accurate evaluation of his leadership abilities.

In all respects, however, his assignments, which predominantly call for him to exercise his specialty in an executive or managerial capacity, demand and develop the essential qualities of a good leader. This becomes more important in view of the trend toward higher military command calling for more executive and managerial leadership than for personal leadership. One may conclude that scientific and engineering specialization among Army officers provides ample opportunity to develop and practice leadership. Specialization should not preclude them from consideration for higher military command. A definite need exists for proper recognition of the inherent and proved capabilities found among specialists.

The discipline of Army organization and administration, and the competence of Army engineers and scientists, have been brought to bear in the past upon great peacetime enterprises of our Nation. These have ranged from the early exploration of the West, to the launching of our Nation's first artificial earth satellite probe of space; from the building of the Panama Canal in 1915, to the building of the US portion of the Saint Lawrence Seaway in 1959; from the conquest of yellow fever in 1901, to the development of a vaccine for the control of the Asian influenza epidemic of 1957, and to continued progress in the battle against the scourge of malaria. The discipline and skills instrumental in these accomplishments will be called upon for the great undertakings of exploration, research, and building that will confront our Nation in the future.

General George H. Decker



LOGISTIC SUPPORT IN *WILLOW FREEZE*

Lieutenant Colonel
Frank B. Case,
United States Army

EXERCISE *Willow Freeze*—United States Army, Alaska's (USARAL's) 1961 winter maneuver—combined weather cold enough to reduce human and mechanical effectiveness with the problems of independent task force support on the thinned-out nuclear battlefield. Five thousand combat and combat support soldiers learned that cold is the friend of the man who makes the best use of it.

The official low reading was minus 37 degrees Fahrenheit, but the troops say that back on the windswept hills the mercury fell to 60 below. Yet cold alone cannot interrupt an operation. At most, cold magnifies the qualitative differences between trained and inexperienced soldiers. The inexperienced man, frightened and resentful of this faceless enemy that he cannot bring into his rifle sight, grows confused in his misery and ends by searching for someone to whom he can surrender. The trained cold weather soldier knows that a hard freeze drives the greenhorn into his sleeping bag and makes enemy sentries dull; then the trained winter fighter hits hardest.

The logistical system that supports an independent task force in the northern winter must be as tough and flexible and long enduring as the men it supports. The *Willow Freeze* logistical system proved generally up to the job.

Exercise *Willow Freeze* engaged an infantry battle group against an airborne battle group in

an Alaskan wilderness area, 30 miles wide by 75 miles long. The maneuver area parallels Richardson Highway, between Glenn Highway on the south and Denali on the north (Figure 1). The West Fork of the Gulkana River winds across the middle of the area, a deeply imbedded stream that hinders ground movement. South of the West Fork the terrain is relatively flat and covered, between frozen marshes, with brush and close-set spruce up to 40 feet high, splashed with occasional patches of birch. Several large lakes and hundreds of ponds dot the area. Above the West Fork, vegetation is sparse and, as the Copper River Basin rises toward the ramparts of the Alaska Range, the terrain becomes bare and windswept Tundra.

The Alaskan winter before the maneuver was dry and snow accumulation was light, except in drifts and hollows. Unseasonable warmth during December and early January threatened the players with a mud maneuver, but the weather turned clear and cold in time to restore firmness to the ground and strength to lake and river ice.

The exercise situation continued USARAL's defense against Aggressor's long-standing efforts to expand his lodgment from the Fairbanks area to secure south-central Alaska. At the

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end of Exercise *Little Bear* in February 1960, Aggressor had been pushed back from the Copper River Basin south of the Alaska Range. During the summer of 1960 he was resupplied and reinforced, and by February 1961 was again probing southward along the railroad in the west and through Isabel Pass in the east. *Willow Freeze* dealt with the latter threat.

Blocked from southward advance on Richardson Highway, Aggressor, played by the 1st Battle Group, 23d Infantry, turned off the main road onto Denali Highway, then south again across country with the objective of cutting the US Force lines of communications (LOC) on Glenn Highway west of Glenallen. On 10 February Aggressor was bivouacked in six feet of snow in Hungry Hollow, just south of Denali Highway, when the 1st Battle Group, 187th Airborne Infantry, in the role of theater reinforcements, parachuted onto Tolsona Lake, picked up its land tail, and moved out to intercept and destroy Aggressor.

Logistic Requirements

Logistically, *Willow Freeze* was a sequel to Exercise *Little Bear*. The 1960 winter maneuver already had pointed up the problems that will arise in supporting mobile forces. After-action analysis clearly indicated the direction that logistic operations should take. The base, like the task force it supports, must be mobile, able to survive in its tactical environment, work along a flexible LOC, and take advantage of the terrain. Limiting the mission to direct support functions, holding stockage to minimum level, using high-tonnage offroad vehicles and mobile supply points, supporting companies in the line by small numbers of helicopters, and maintain-

ALASKA AND THE WILLOW FREEZE MANEUVER AREA

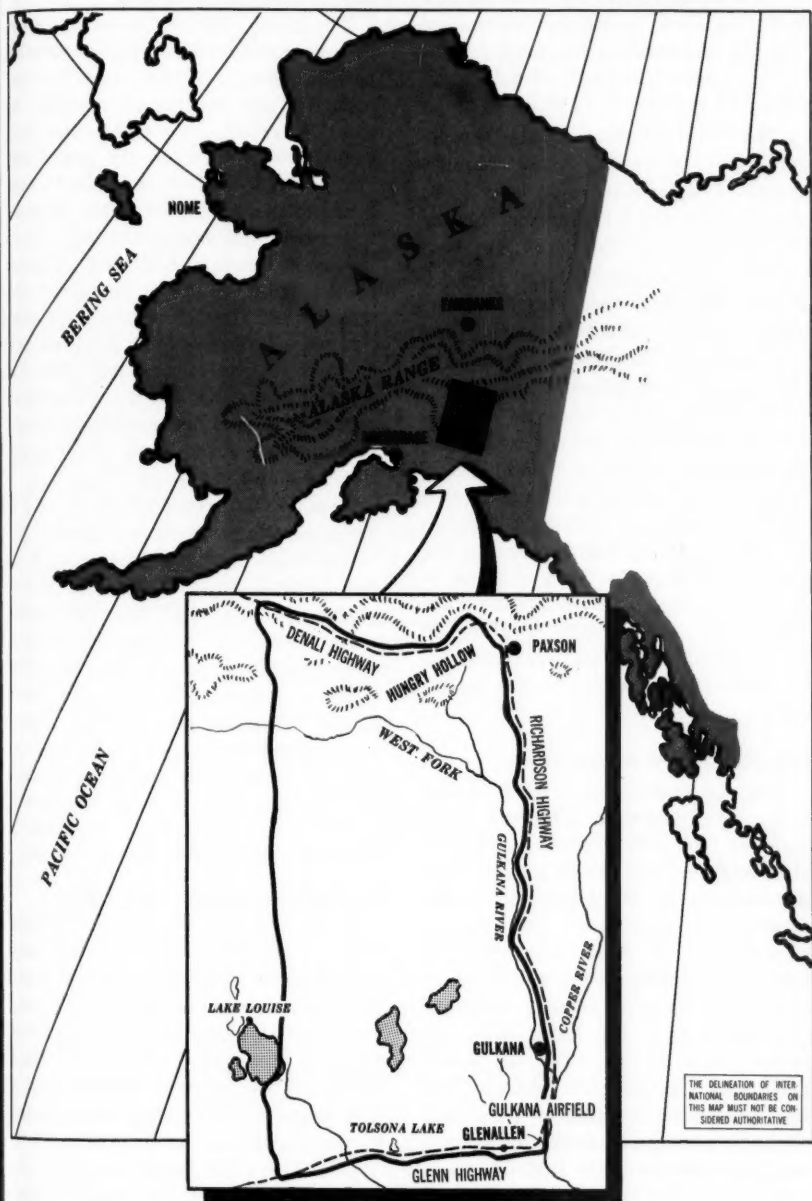


Figure 1.

ing an aggressive attitude toward the tactical direct support mission all promote logistical mobility. The maneuver also emphasized the need for developing better methods of petroleum, oils, and lubricants (POL) supply.

The *Willow Freeze* logistic concept undertook to satisfy these requirements. The general support (GS) group, located at Gulkana just outside the maneuver boundary, in effect formed a third player force. The GS group organized two direct support (DS) groups which supported the task forces in the maneuver area. The DS groups were generally equivalent to the battle groups' slices of division trains, reinforced with additional maintenance capability and special transport and provided with their own command and staff elements (Figure 2). The GS group was responsible for delivery of supplies from Gulkana to the DS groups. The DS groups were responsible for forward delivery to battle group trains and, as required, to forward elements of the battle group task forces.

Extended Lines of Communication

The Aggressor LOC ran 63 miles north on Richardson Highway from Gulkana, 16 miles west on Denali Highway, and then south into the maneuver area. At the beginning of the exercise, the Aggressor LOC was approximately 90 miles long. By the time the opposing forces met at West Fork, the forward combat elements were more than 120 miles from the general support base. The US Force LOC was considerably shorter but also presented formidable time and distance problems. Efforts to shorten the time-distance of the LOC by cross-country movement met only limited success with the available equipment,

but indications of future development possibilities were obtained.

The chief difficulty resulting from this extended transportation operation was the long reaction time between ordering and receipt of supplies by the DS groups. To offset the long turnaround time, each DS group carried a small load of supplies to supplement the supported battle group's basic load. However, the DS group supply load was not allowed to grow to the point where it impaired the mobility of the DS groups. Helicopters were made available for high priority resupply movements. Reorder reaction time was further shortened by use of a modified scheduled supply system that saved both administrative time and personnel effort.

Fuel (POL) resupply, a always a basic logistic problem, was greatly facilitated by new equipment such as the *Nodwell* track truck, the 10-ton offroad trailer, and the collapsible tank. From the DS groups forward, cross-country cargo carriers provided effective support that overcame some of the difficulties of extended supply lines. However, rough terrain forklifts could not be obtained for maneuver use and the potential manpower savings from palletizing supplies in forward areas could not be exploited.

Deficiencies in Airborne Organization

Willow Freeze experience indicated that, if properly trained personnel and effective coordination channels are provided, direct support groups may be attached either to the supported force or retained under operational control of the general support group. The Aggressor DS group was attached to the Aggressor battle group while the US Force DS group remained under control of its parent organization. Attachment worked out well for Ag-

ORGANIZATION OF DIRECT SUPPORT GROUPS FOR WILLOW FREEZE

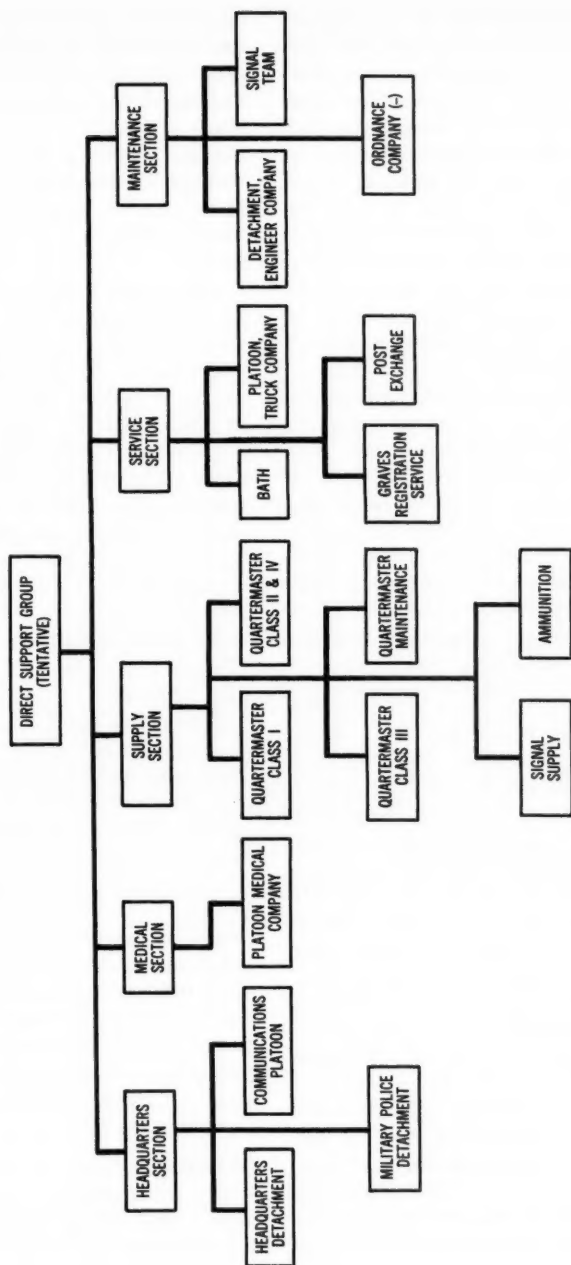


Figure 2.

gressor, although tactical and mission control of this additional force put some strain on the battle group staff. The US Force DS group operation was less successful, largely because sufficient consideration was not given to the fact that the airborne battle group, in contrast with its infantry cousin, is not organized logistically for sustained operations involving extended movement. The organization is limited, organic transportation is inadequate, and the logistic staff of the airborne battle group is small.

In situations in which an airborne force is required to perform a mission involving sustained operations over relatively long distances—a probable one in northern airborne force employment—it may be desirable for the DS group to absorb battle group trains and provide staff, transport, and operating capabilities sufficient to establish a logistic capability comparable with that of the infantry battle group.

Stretching Logistical Lines

Both forces allowed their logistical elements to stretch out far behind them. Those in Aggressor's rear stretched out partly because a 10-mile section of Denali Highway was closed by drifts for several days. During this time direct support engineer effort had to help the general support construction company in keeping the LOC open. While Aggressor was looking over his shoulder during this period, he was unable to close up his trains and DS elements. US Force was simply too short of transportation to move its logistic elements. In fact, at one point when transportation had been withdrawn from the US Force battle group trains in order to displace the battle group command post (CP), it was necessary for the DS group to

move some seven miles ahead of the trains to maintain support continuity. The long, thin rear area situations that developed behind the player forces were extremely vulnerable to enemy action. While neither side took advantage of the other's vulnerability, it is safe to assume that a foreign enemy would not be equally considerate.

Each battle group carried a nominal three-day load of rations (Class I supplies), about a day's supply of fuel (Class III), and its basic load of ammunition (Class V supplies). DS groups carried an additional day of Class I and V and up to two days of Class III, plus a bench stock of maintenance parts. The GS group replenished the DS groups daily, subject to normal interruptions and accidents. Replenishment issues were made on a modified scheduled procedure which eliminated requisitioning for Class I, III, and V, and saved time and effort at all echelons.

Expendable Class II (spark plugs, lantern mantles, and surgical dressings) supplies could be included in the system for an operation of longer duration. The consumption of nonexpendable Class II supplies at the battle group task force level, however, is too low to make the automatic issue procedure worthwhile. The supply loads and resupply procedures provided a flexible and well-balanced system which, with refinement based on further experience, would afford economical and responsive supply support for the battle group task force operating independently.

Outstanding Vehicles

The transportation stars of the exercise were five *Nodwell Model 110* cargo transporters. The *Nodwell Model 110* is an industrial tracked vehicle

rated at 5½-ton capacity. The vehicle, which was designed to support logging and oilfield work in northern Canada, weighs about 11,000 pounds, giving it a one-to-one payload-to-net vehicle weight ratio. The tracks are fabric belts with steel grousers, running on pneumatic road wheels. The engine and most of its components are standard industrial items. The vehicle's

two broken pintle hooks, which were repaired by the operators.

The *Nodwells* performed spectacularly when Denali Highway was blocked by 12-foot snowdrifts, burying two 5,000-gallon tankers, a bulldozer, and several other vehicles. The *Nodwells* maintained the flow of supplies while engineers struggled to reopen the road in the face of the bliz-



Nodwell Model 110 track truck

outstanding characteristics are simplicity, light weight, dependability, and superior cross-country mobility.

The five *Nodwells* were allocated to Aggressor, who had the more difficult trafficability problem. They operated around the clock during the entire exercise, carrying up to 20 percent overloads and towing the 3½-ton weight of rolling liquid transporters. Mechanical failures were limited to a broken fan belt, a radiator leak, and

zard. The sturdy, dependable, low-ground-pressure trucks ran over the top of the drifts from Paxson to Hungry Hollow, carrying rations and fuel—and rescuing stranded operators of wheeled vehicles—for four days, until the winds eased.

The air-transportable *Nodwell* has been airdropped by the Navy in Antarctica. With its simplicity, dependability, high payload to vehicle weight ratio, and outstanding cross-country

performance, it appears to offer an opportunity for a qualitative improvement in combat mobility.

Experimental Truck

The US Army Transportation Environmental Operations Group (USA TREOG), which furnished and operated the *Nodwells*, also provided the prototype *Wagner* four-track truck for experimental use in the exercise.

ing capacity. Because it is larger and heavier and has a higher silhouette, it cannot compete with the *Nodwell* type carrier for close support operations. However, the *Wagner* demonstrated impressive power and excellent mobility, including the ability to break its own trail through close brush and small timber. The basic design concept appears adaptable to a va-



Wagner four-track truck

This vehicle consists of two tracked units steered by a powered joint. The tracks are rubber belting with steel grousers and, like the *Nodwell* and most other modern commercial over-snow and overmuskeg vehicles, run on pneumatic road wheels.

The *Wagner* is rated at seven and one-half tons capacity and is capable of carrying up to 100 percent overload, depending on the ground bear-

riety of applications, including recovery of armored carriers and lighter vehicles, ammunition transport, transport of missiles and rockets, and use as a cross-country prime mover.

A test model of the Army's 45-ton overland train, which has proved effective in arctic and desert operations, was also used in *Willow Freeze*. Previously, a commercial overland train operated successfully in Alaska dur-

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ing the construction of the Distant Early Warning (DEW) Line, carrying loads up to 600 tons. The Army train was introduced into *Willow Freeze* to test the concept of using a high productivity transport system in forward area operations.

The swampy region in the southern part of the maneuver area, which presented greater obstacles than the rel-

the train in a belt of birch, penetrated two tires and immobilized the giant.

The lack of convenient tire-changing equipment caused excessive delay in making repairs; much maneuver time was lost. Later the train was used in the Aggressor area where vegetation was thinner. Just before the exercise ended, the train successfully



Overland train

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actively treeless plains of the northern sector, was selected as the train's initial area of operation. The giant vehicle broke its own trail through five miles of brush and small spruce on its first mission. This excellent performance led to overconfidence and ultimately to disaster when the operating crew, believing that nothing could stop the "Monster," grew careless of potential ground hazards. The stump of a small frozen tree, snapped off by

accomplished a cross-country resupply movement.

Tire trouble prevented comprehensive evaluation of the concept of using high productivity transport in forward support operations. In effect, this trouble emphasized that the giant-wheel, pneumatic tire configuration, which is designed for rear area operations, is not suitable for forward support. In rear areas, the giant-wheel overland train, replacing destroyed

railroads and hauling up to 500 tons of supplies, can be highly effective. In forward areas, a lower-capacity system is required which will afford comparable manpower economies and cross-country mobility independent of even minimum route preparation.

POL Supply

The *Willow Freeze* POL supply system was an outstanding success. Its success hinged on the quartermaster's

Richardson to the maneuver area. The 20,000-gallon units were located at the DS groups.

Bulk gasoline was hauled from the GS group by 5,000-gallon semitrailer and pumped into the flexible storage tanks at the DS groups. From the field storage tanks, vehicles were refueled on a service station basis and rolling liquid transporters and drums were filled for forward distribution.



A 10,000-gallon collapsible pillow tank

mobile distribution and storage equipment, which consists of collapsible pillow tanks and allied pumping sets. For *Willow Freeze* operations, the six-tank system was broken down into four units, two of 20,000-gallon capacity and two of 10,000-gallon capacity. The smaller sets were used for vehicle servicing at the general support group and at the midpoint of the long highway haul from Fort

In a typical movement, 30 drums—about a six-ton load—were loaded on a *Nodwell* tracked carrier which also towed a 1,000-gallon rolling liquid transporter (RLT). Carrying and towing 2,600 gallons of gasoline, the *Nodwells* distributed Class III supplies up to 30 miles forward of the DS group. Drums were dropped off for small users; tanks and armored carriers were refueled directly from RLT's.

The pillow tank and the pumping equipment allows a bulk storage point to be set up rapidly. A two-tank, 20,000-gallon supply point required about three hours' installation time at low temperatures. Earlier experience with flexible tankage in cold weather suggested that pillow tanks would prove unsuitable for northern operations. However, no difficulty was experienced in unrolling and installing the tanks at minus 20 degrees and the only tank failure resulted from a curious infantryman's bayonet.

The rolling liquid transporters in the hands of the Aggressor provided rapid forward movement of large quantities of fuel with minimum expenditure of manpower. During air-transportability exercises prior to *Willow Freeze*, the transporters were used to carry bulk fuel on C-123 aircraft, which could not lift tactical tankers. In comparison with tank trucks, they saved five tons or more of airlift weight for each thousand gallons of POL tanker capacity transported into the airhead.

In cross-country operations during the preceding summer, RLT's demonstrated their floating capability in stream-crossing operations. In Exercise *Willow Freeze*, the marriage of RLT's and the flexible field supply point system produced a rapid, economical, responsive method for POL support of fast-moving combat forces.

Medical Support Operations

Willow Freeze medical support operations were marked by successful employment of several experimental items of equipment. One hospital unit of the 64th Field Hospital, located at the General Support Base at Gulkana, provided field medical support for both Aggressor and US Forces. Most of the professional staff of the hospital

consisted of Reserve doctors and nurses on active duty for training for the exercise. The unit performed several major operations and treated a considerable number of nonbattle casualties, in addition to handling several hundred outpatients.

Among the experimental items tested were polyethylene containers for freezable solutions. Glass bottles break when their contents freeze (or when they are dropped); polyethylene bottles simply expand (or bounce). Disposable hypodermic syringes were also used successfully. The disposable syringe provides a sharp sterile needle at all times, thus eliminating the need for sterilization apparatus and the resharpening of standard needles. Both of these items contribute significantly to operating efficiency in cold weather operations.

The battle group aid stations used Polaroid X-ray units. The Polaroid X-ray operates on the same principle as the Polaroid Land Camera and eliminates the need for a darkroom, transporting chemicals, and developing tanks. In field operations its use reduces the weight of supplies and equipment carried and saves time and effort. Although present film is not large enough for full chest X-rays, the Polaroid X-ray provides a 60-second diagnosis of sprains and fractures. For experimental purposes, chemicals and film were allowed to freeze, then were thawed and used. Except for a slightly increased exposure time requirement, freezing had no significant effect on the materials. The Polaroid X-ray is a significant improvement in field medical capabilities.

The Aggressor battle group aid station was furnished an M116 amphibious cargo carrier for field ambulance use. This new vehicle, a replacement

for the long-faithful but now obsolete *Weasel*, has excellent cross-country mobility and can accommodate four patients on litters. Battle group personnel enthusiastically endorsed its use.

Difficulties were encountered in evacuation of casualties from forward areas to the field hospital. Since Gulkana airfield was nearby, a landing pad was not constructed at the hospital and aircraft were not designated specifically for air ambulance service. In practice, aircraft were sometimes not available when needed and evacuation of actual casualties was occasionally delayed. In future USARAL operations, landing pads will be constructed at field hospital locations and, if air ambulance units are not available, other aircraft will be allocated specifically for air ambulance service.

Highlights

Exercise *Willow Freeze* demonstrated that, with proper equipment and operating methods, an infantry battle group task force can be supported in sustained operations in undeveloped regions during the arctic winter. The direct support group organization proved to be basically sound. The combination of flexible bulk storage tanks and rolling liquid transporters provided an effective, high-volume POL supply system. Commercial tracked cargo carriers improved battle group mobility. Field hospital operations were relatively unimpaired by cold weather and new medical equipment items improved operating capabilities. Helicopters again demonstrated over-all economy and responsiveness in supply support of forward combat elements.



M8A2 cargo tractor towing a 10-ton offroad trailer

At the same time, the exercise highlighted requirements for further development of logistic support capabilities for northern operations. Some specific equipment needs were indicated. For example, warmer and more mobile shelter for field hospitals is required. At outside temperatures of minus 30 degrees, the temperature in a ward tent five feet from the ground, with two stoves going, was about plus 30; at bed level it was about 20 which is too cold for patient care.

A bottom-opening, double-action zipper is required on the issue sleeping bag to permit its use as an evacuation bag in forward areas. A fine evacuation bag is available as an issue item, but the frontline medic needs something immediately at hand to keep casualties from dying of shock in extreme cold before they can be treated.

Rough terrain forklifts are essential to permit forward area exploitation of the manpower-saving potentialities of palletizing supplies. A tracked overland train, of from 30 to 50 tons capacity, appears desirable for supply distribution from division to battle group and combat command. Water supply methods need improvement. Field bath units, which were able to operate successfully at *Willow Freeze* temperatures, need sufficient mobility to keep up with battle group trains.

Requirements of this kind can be satisfied fairly easily. But the exer-

cise pointed also to the basic inadequacy of existing Army equipment for modern combat operations in the north. Available combat and combat support equipment is far too heavy. On the hard-frozen ground of the northern winter, tanks and self-propelled artillery can operate freely; in summer they are quickly immobilized by muskeg and marsh.

Support requirements for current equipment are too high. Every logistic operation, from maintenance to medical support, requires augmentation to furnish the supplies and services needed to keep present-day formations moving in extreme cold and in summer mud. Not just individual items are needed, but complete systems of air-transportable, low-ground-pressure equipment with high combat effectiveness, all-season cross-country mobility, and low support requirements. And the need is today's need, not an objective for the next decade.

The 50-degree isotherm is the defined boundary of northern operations. Above this limit lie half of North America and 65 percent of the Soviet Union, including Russia's entire coastline outside the Baltic. The Army's Alaskan maneuver experience provides sound northern operations training, but training is not enough. A major Army effort is necessary to design and produce the combat and logistic equipment the American soldier needs to meet an experienced enemy on equal terms in the winter cold and summer mud of the North.

A SOLDIER-SCHOLAR team recently suggested that it is high time Army officers started making a greater contribution to thinking on national security policy matters. They warned that "civilian scholars have a competence that is important" and that "we of the professional military may disregard them at our peril—or, more likely, at the peril of abrogating to them some part of our proper responsibilities."

Too often, propriety and the framework of required discipline within which military men speak have governed discussion more than has the fundamental objective—thought. It is this latter quality with which we should concern ourselves. Too often we get so enmeshed in day-to-day activities that we completely overlook our larger responsibility—developing ourselves professionally and making known productive ideas that may be of value to the service.

No single person, no single idea can stimulate the Army to a higher output of significant thinking or change overnight the unproductive atmosphere in which discussion sometimes proceeds. However, a three-point program vigorously and conscientiously implemented throughout the Army could lead to an environment more conducive to productive thought and discussion, benefiting the individual and the Army. Military men applying these techniques will provide "an atmosphere where negativism, defeatism, and precedent are checked at the door."

The three points of the proposed program are not original. Each point derives from known and reliable techniques of creative thinking.

These are the suggestions:



a program for self- improvement



**Major Lucian K. Truscott III,
United States Army**

- An incentive for military persons to read and discuss current and classic writing pertaining to their profession.

- Assistance to military persons in carrying out professional research, study, or writing.

- An administrative procedure to ensure that ideas and suggestions "get to the top" and are properly evaluated.

Military Reading-Discussion Group

A military reading-discussion group provides an incentive for reading—something many of us fail to do. It also provides a forum in which knowledge gained through reading can be



broadened by analysis of the opinions of others. Finally, it serves as a source of original thought, study, and writing.

Many of us are "nonjoiners," who shy away from groups. We're inde-

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pendent. We think that "on our own" we read all of the professional literature we can—or need to. We feel that our interpretation of the written word is as good as the next man's. Such reasoning today is not only naive, it is dangerously fallacious. This is proved to us daily in staff or committee meetings. Someone embarrasses us by expressing a thought we hadn't considered in our analysis of the problem. Another, by a more thorough analysis of the same facts that were available to us, may change our understanding and attitude on a subject completely.

Motivation by group participation, in addition to encouraging us to read so that we may intelligently discuss the reading, will clearly demonstrate the necessity of analytical reading by showing that there are many possible interpretations of the written word. A byproduct is improvement of our own ability to express ourselves orally and in writing.

The Great Books Foundation sponsors discussion groups, which have a similar purpose. They are formalized to the extent that the Foundation furnishes not only lists of books to be read over a period of several years, but also a guide for the discussion group leader and a question outline for each meeting.*

Experience here at the U. S. Army Command and General Staff College shows that forming a group is quite easy. I offer no set pattern. Requirements will vary with different locations and groups, but several basic considerations should be observed.

* The Great Books Foundation, a nonprofit corporation, expresses an interest in this proposal to the extent that they will welcome queries on organization, guides for discussion group leaders, and other problems connected with the formation of reading-discussion groups. Questions may be directed to The Great Books Foundation, 5 South Wabash Avenue, Chicago 3, Illinois.

An optimum size for such a group is about eight to 10 individuals. This might require formation of two or more groups in an installation where many persons are interested in participating.

Right from the beginning our group faced the problem of acquiring enough copies for eight to 10 people to read a given selection of books in the three-week period between group meetings. Our library helped and some participants purchased their own copies of reading texts. Paperback editions at reasonable prices are available for a few titles, but not as many as we first thought.

If more than one group is formed, a staggered schedule of reading assignments would permit wider use of a limited number of books. The first group can pass along appropriate questions and discussion points to the other groups. A group leader or moderator should be designated for each meeting, and other than the administrative job of assigning the reading, he has no specific duties. During the meeting he keeps the discussion moving with questions and ensures that it doesn't wander from the assigned text.

If discussions are limited to two hours every three weeks, coverage should be restricted to a specific subject within a selected book. This can be accomplished by assigning only two or three chapters of a book, for it proves difficult, if not impossible, to discuss a full-length book in a two-hour period. Of course, the group may devote several sessions to a single text, if the members desire.

Reading lists help in selection of appropriate readings from the wide range available. Here, again, library assistance proves most useful, or, as our group has done during its trial

period, the moderator can select his own text.

One of the most attractive aspects of the proposal is its flexibility. It can prove useful to a wide range of personnel, depending upon age, experience, and length of service. It requires effort on the part of some individual to start a group and to select the reading material. If the material is properly selected and the discussions properly monitored, the objectives may be attained: reading, learning from discussion, and serving as a source of original thought.

Individual Advanced Study

The proposal basically is to grant an individual time off from normal duties so that he can perform advanced individual professional research, study, or writing. It would also grant him a modest sum of money to help defray the cost of research assistance, travel, supplies, and other material incident to his project.

Projects might range from a sergeant in a tactical unit taking a month or two to perfect a stabilizing device for a machinegun bipod to a lieutenant colonel undertaking a study on methods of tabulating unit radiation doses.

There is a precedent for such activity in civilian educational institutions. Many of them provide their faculty members with both time and money for advanced study, in some cases over and above regular sabbatical leave. It is interesting to note that prior to World War II some of our service schools granted "academic leave" to instructors.

To my knowledge, such a program is nowhere in effect in the Army, but some general impressions of the functioning of such a system on the staff and faculty of a service school, for example, might be useful.

As a general rule participation would be restricted to persons in their last year of duty on the faculty. An *ad hoc* committee of senior officers could be designated to accept applications from faculty members and make appropriate recommendations to the approving authority. Time granted for study could be limited to a maximum of three months.

At the beginning of the fiscal year an appropriate sum of money could be "earmarked" for funding the program. If, for example, a planning figure of \$300 per project and approval of two projects per quarter were completed, \$2,400 could be set aside. This would preclude the disapproving of worthy projects for lack of funds during the year.

Subjects of study might be restricted to areas of particular interest to the school. But this should not be an inflexible rule—especially at higher institutions such as the U. S. Army Command and General Staff College U. S. Army War College levels. Since the participants at these institutions are mature individuals they should simply be granted without restriction the time and money to advance themselves and the Army professionally, even if there are no immediately measurable results.

Undoubtedly there will be many questions and counterarguments about such a proposal. Can a unit or school afford to lose the services of an individual for two to three months? Can't the industrious individual find the time and facilities for such projects? Do not formal studies continually take place in a unit or school—usually in committee with the advantage of more than one mind analyzing a problem? These are all pertinent arguments.

There is no answer for every possible argument except that many of our outstanding civilian educational and business organizations have long recognized the value of individual advanced study. How many of the world's great inventions have been primarily individual efforts? How much of the world's great writing has been individual effort? The armed services, too, have recognized the value of advanced study, at least to the extent of engaging private research firms such as the Rand Corporation, Operations Research Office, and others to make studies, some of which are individual in nature.

Army personnel are capable of the same type of creative thinking and analysis. Certainly many professional soldiers are as qualified as most civilians in the analysis of military problems with which they are intimately familiar—a familiarity based on practical as well as theoretical knowledge. The Army must decide whether it can afford the time and, perhaps, money to assist them.

Creative Idea Program

Among the many factors that work against an individual's expression of new thought are:

- Lack of time, whether real or imagined.
- The normal requirement of a thoroughly researched staff study as the vehicle for presentation of a new thought.
- The possibility that the proposed thought may differ from that of the individual's immediate superior.
- Lack of confidence as typified by the feeling: "I'm sure someone has already thought of this."

In spite of the obstacles, there are incentives: orders or commands, ap-

peal to professional pride and patriotism, awards, and, perhaps most important, the assurance that someone in authority will see or hear about the thought. A formalized system for the development of creative ideas will serve as an outlet and a stimulus for new thought.

The first requirement is an authorized means, which may be a standard form, by which an individual can submit his idea in any length from a single sentence to a complete staff study. The individual should sign the form and state whether he is merely offering his idea for consideration or that he desires to be included in any further study.

The secretary's office in a service school can administer the system—or, in a unit, the executive officer or secretary of the general staff. An *ad hoc* committee made up of widely experienced members could assemble as required to examine the ideas, cull out the obviously unsuitable, and assemble those worthy of further study for presentation to the commander. Once the commander has been briefed, and given the opportunity to add command emphasis, the ideas can be forwarded to the proper agency for further study. When study is complete, the commander will decide upon the appropriate action to be taken. The author of the idea should be advised of the final decision.

Obviously, this procedure is contrary to the accepted method of presenting only completed staff action to the commander. Nothing about the concept is "normal." Its success depends upon command emphasis, which will not be given if the commander hears or sees nothing until the finished product reaches him.

The subjects on which ideas can be

submitted should be limited to those of primary interest to the organization concerned. The command could appropriately announce problem areas in which creative thought is desired. As a further stimulus, a summary of creative ideas presented could be circulated. This would permit an individual to expand on someone else's original thought with a "twist" of his own.

Individuals should be aware that formal recognition of their ideas will not come as a matter of course. Only in unusual circumstances would their efforts be considered anything beyond a normal part of duty.

Such a system would actually discourage new ideas if those concerned believe that each thought would generate a crash project. Suspense dates should be studiously avoided.

Command emphasis, when such a system is initiated, would be a major requirement for success. The commander himself should brief his personnel and indicate that the system has his backing and his personal interest. This will forestall any criticism that the system violates the time-honored chain of command principle.

New thoughts, new ideas, creative thinking—whatever you call them—exist. Because of the basic structure of the military environment, they often have no outlet and receive no stimulus. Give the average man an outlet for his ideas—an outlet which he is not afraid to use—and he will produce.

The first two proposals—the reading group and advanced study—are intended to stimulate individual development. The creative idea program points specifically toward improvement of the Army. Regardless of whether the unit or the individual participates, the Army will benefit.

On The Principles Of War

John D. Keegan

IN 1810 Karl von Clausewitz, a young Prussian officer serving on Scharnhorst's staff, was appointed military tutor to the Prussian Crown Prince. In the scheme of instruction, which he prepared for the approval of his superiors, appears a passage on what he calls the principles of war. In them he defines the object of war as the destruction of the enemy's forces in battle and the seizure of his material means of aggression. The methods necessary to these ends are concentration, mobility, offensive action, and surprise. He expands on this theme at greater length in the paper. The scheme was accepted but survives now only as an appendix to the collection of papers—which we know as *On War*—published by his widow after his death in 1831.

In 1811 Clausewitz left Prussia to take service under the czar, while the bulk of the Prussian forces prepared

unwillingly to take their place in the army of 20 nations which Napoleon was preparing for an invasion of Russia. Napoleon's plans for his adventure were, in essence, Clausewitzian, but this is only to say that Clausewitz had so far formed his theory of war largely by contemplating Napoleonic example and, at Jena, suffering its effect.

Napoleon intended to attack the Russian armies without warning, divide and defeat them, in turn, by swift marching and mass of numbers, and then to move on to Moscow and to dictate peace from the Kremlin. On 24 June 1812, without a preliminary declaration of war, the Grand Army of 633,000 men crossed the Nemen.

It is unnecessary to trace the course of subsequent events. The Russian armies melted away before the invaders, but by forced marches of unprecedented speed Napoleon at last achieved the general action he had

planned. In a bitter day's fighting at Borodino he inflicted casualties of some 40,000 on the Russians and suffered approximately 30,000 of his own, a loss of about one-third of the total engaged. Eight days later he entered Moscow. The concept of war which had reaped such harvests at Austerlitz, Jena, and Wagram seemed at the 11th hour to have proved successful again. Despite the epic horrors of the retreat which followed, and the total collapse of the Napoleonic empire three years later, which may be regarded as its direct result, Clausewitz later saw no reason to suppress his youthful recipe for military success.

Misdirected Search

Because the Soviet Union and Western Europe are today again ranged against each other, it is tempting to look for similarities between the conditions of 1812 and 1961, but such a search is misdirected. The contrast between the destructive power deployed by armies then and now ought to dispose of the argument that "weapons change but war remains the same." This argument, however, is still advanced. This may be because the difference is not often demonstrated graphically enough.

At Borodino the Grand Army expended about 60,000 rounds of artillery ammunition and 1.4 million musket cartridges, representing the use of about 200 tons of gunpowder. To produce this modest discharge of energy, Napoleon had marched 600,000 men 600 miles in 75 days in tight

military formation. The firing crew of a tactical nuclear missile control a device which can deliver the equivalent of 50,000 tons of gunpowder. This figure looks meaningless and it is, of course, wrong to compare propellant power with explosive power. However, it is also wrong to compare a military organization which depended for its effect on powder and shot with a military organization which can, in a theoretically successful surprise attack, cause 100 million enemy deaths. The difference is precisely that between propellants and explosives, between an army of 600,000 muskets and a nuclear stockpile of 30,000 megatons.

Revolution in Policy

A search for similarities between the political and diplomatic attitudes of East and West in 1812 and 1961 is equally fruitless. The revolution in weapons has produced a revolution in policy. Despite provocation which would have been the signal for instant retribution in the 19th century, open conflict is, in some makeshift way, avoided. Each side insists that its posture is defensive. There are proposals for disarmament and for the creation of nuclear free zones in Europe. There is permanent discussion of methods for the prevention of surprise attack and for the sure detection of nuclear tests. There are frequent expressions by heads of states of the desirability of total disarmament; the expressions go as far as the conference table. Both sides declare openly that unlimited nuclear war is unthinkable and that any alternative form of war is immeasurably dangerous.

Since 1945 the proxy conflicts between East and West have been settled by political arbitration when their extension seemed at all imminent. The

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United States, after a long adherence to the moderate policy of containment, seems now to have taken up the Soviet Union's own challenge of peaceful competition, an even less overtly military attitude. Yet the official teaching of all armies still preserves a doctrine of war which does not differ materially from that set out in 1810 by Clausewitz in his scheme of instruction for the Prussian Crown Prince—the doctrine of the destruction of the enemy by swift and unrelenting violence, a doctrine which governments and armies otherwise reject but which still survives in the troublesome form of the principles of war.

Status of the Principles

In 1960 the British, Canadian, and US Army lists of principles included selection of the objective, concentration, offensive action, and surprise. The French Army, which has unhappy memories of commanders overenamored of the doctrinal approach to war, has a much shorter list, but it includes surprise and concentration. The Red Army has a characteristically different list, which stresses desirable practical qualities. But "Other Principles of War, of equal or even greater importance, exist in Soviet Military doctrine. Some of these (the offensive, concentration of force, maneuver and cooperation . . .) are probably more important relatively than in Western military doctrines." *

This is no place to discuss whether Clausewitz took account of an alternative form of war. Indeed, it is recognized that toward the end of his life he was moving away from the crudities of his youth, of which the "Summary of Instruction" is the most important example. What is certain is

that the soldiers of the 19th century, with some distinguished but uninfluential exceptions, took him to mean that the only object in war was the total destruction of the enemy.

Descent of Ideas

It is, of course, always difficult to prove the descent of ideas, but Clausewitz seems to have captured the Prussian Army by the 1840's and certainly its leaders at once put this interpretation on his work, as the campaigns and writings of Von Moltke, Schlieffen, and Ludendorff successively betray. The French Army discovered Clausewitz in the 1880's, where his influence showed through the teachings and plans of Cardot, Foch, and Grandmaison in a more extreme glorification of shock and numbers. The English, who seem to acquire ideas by osmosis rather than intellection, were never overtly converted to Clausewitz, but their practice in the First World War exemplified his earlier ideas. Clausewitz, directly or indirectly, influenced all Western armies from about the middle of the 19th century onward.

Hegel's Ideas

Much of Clausewitz' influence derived from the way his ideas coincided with many of the more important strands of 19th century thought. Unfortunately, it coincided with much of what was worst, particularly with the Hegelian idea of the national state, with crude misapplications of the law of natural selection, with *laissez-faire* economics, and with the theory of the class war. Perhaps the most interesting connection is that with Hegel, on which both Brodie and Gorlitz have commented. Brodie shows how the unphilosophical generals of the 19th century, misled by his use of the Hegelian dialectical method, adopted his theses:

* Raymond L. Garthoff, *How Russia Makes War*, Allen & Unwin, Ltd., London, 1954.

"War is an act of violence pushed to its utmost bounds," but overlooked his careful negations "the political object, as the original motive in war, will be the standard for . . . the amount of effort to be made."

In this misinterpretation one might like to discover the origin the 19th century's glorification of the offensive. Gorlitz has pointed out the way in which Clausewitz underpins Hegel's political ideas. Hegel thought of states as individualities and of wars as irrepressible conflicts between them. Because Clausewitz thought of war above all as an instrument of state policy, his military ideas subserved Hegelian political philosophy. Moreover, because Hegel believed that war was the method by which civilization progressed, through the victory of a nationally superior state over an inferior, and because Clausewitz apparently brought system to this process of conflict, his ideas were doubly acceptable to a century which believed passionately in system and progress.

Perhaps this is seen most clearly in the influence that Clausewitz has had on Marxist military thought. Marx, of course, owed much of his system to Hegel, but for "state" he substituted "class" and for "war" he substituted "revolution." This did not prove to weaken the appeal which Clausewitz had for him or for Engels, or indeed for almost all Marxists. Engels wrote an enthusiastic commentary on his work and Lenin and Trotsky were strongly influenced by him, as has been the whole of Soviet military thought.

The influence of Hegel on Hitler does not have to be mentioned. It is well, however, to be aware of the dilute influence of Hegel on all modern states and on their beliefs in sov-

eighty and national ideals. One can, in fact, construct a not too fanciful diagram of the descent of ideas which would show military and political leaders on all sides in both World Wars moving in fatal step to the score of old Hegel and young Clausewitz.

Grounds for Attack

Not that anyone would object to men reading Clausewitz. What is objectionable is that his earlier and cruder ideas should be reduced to capsule form and raised to the status of dogma. The accepted list of principles has, of course, often been attacked before. The most common grounds have been either those of meaning, categorization, exclusiveness, in exclusiveness, internal contradiction, or historical invalidity. It may be useful to examine the grounds on which these attacks are made before discussing graver objections to the possible influence of the principles on future events.

The meaning of the principles is undeniably obscure, but it is an oracular obscurity, and this is the basis of their strength. Their forcefulness and simplicity impress the uninquiring mind. The principles, we are told, apply at all levels, times, and places. What we are not told is what these principles are. Are they straightforward principles of cause and effect? Can one say "concentration produces breakthrough" in the way one can say "friction generates heat"? Obviously not, there are too many examples to the contrary: the Somme, Paschendaele, the Ardennes.

If not causal, are they then descriptive? Can one say "surprise is necessary for a successful offensive"? Again, there are practical objections, because one can produce examples of offensives succeeding against forces

which knew only too well when and where the offensive would come. The Russian Stalingrad offensive of November 1942 and the Japanese attack down the Malayan Peninsula are good examples. Moreover, in many successful offensives, surprise has played only the smallest part, and success has been achieved only after the enemy has regained balance following a first assault (for example El Alamein) or as the result of routing an enemy offensive which itself achieved preliminary surprise (the Marne, 1914).

Are the principles, then, simply guides to conduct? If so, they are obviously of little use by themselves and need to be supported by a great deal of empirical knowledge in the commander and to be applied in the most favorable material circumstances.

Obscure Meaning

If the force of the principles is unclear, their individual meaning is even more so. What does concentration mean? Does it enjoin concentration before the battle or on the battlefield? Concentration of fire or of numbers? Concentration against the weakest part of the enemy's forces or against the strongest? Against his flanks or his center? Does it mean concentration against his field army at all? Might it not mean concentration against his economic base, his communications system, or his centers of population?

Argument at this level will descend to the level of specific historical example or, at worst, merely to the reiteration of personal attitudes. But it emerges that it is only after the meaning and status of the principles have been questioned that the inquiry begins, although normal practice demands that general principles should be the fruit of inquiry.

Another group of critics believes that the principles are too exclusive, and that such concepts as "intelligence" or "subversion" or "training" should be included. This is a convincing objection. One can see no reason for the exclusion of any activity generally and successfully resorted to in war. Therefore, the contrary argument, that the principles are not exclusive enough, is unconvincing. The principle of concentration may well depend upon the observation of mobility, administration, and cooperation, but this is no reason for omitting them. The categorization of the principles is, again, unsatisfying.

Administration and cooperation are the basis of any organized activity and no one would quarrel with their inclusion. They seem to differ in kind from the principles of selection of the aim, concentration, and offensive action which, whatever they may be taken to mean, are obviously operational principles levying demands upon the initiative of the commander. They lie within the field of the will. But to take two others, surprise and morale do not lie within that field. Surprise is, in the last resort, a matter of luck, and morale is an incalculable.

Finally, although some of these principles have been described as lying within the field of the will, it is clear that some lie there more securely than others. The enemy is unlikely to interfere with the commander's selection of his aim, but he may severely hamper his efforts to concentrate.

Internal Contradictions

A favorite argument deployed against the principles is that the list contains internal contradictions, that maintenance of the aim is not compatible with flexibility, or that economy of force conflicts with concentration.

Such arguments would be more fruitful if the meaning of the principles was clearer, but there is undoubtedly a real difficulty here. It can be solved partially by exegesis. The British list, at least, is a patchwork, and "flexibility" has been added comparatively recently (since 1929) just as "mobility" has been excised (after 1950). The root of the trouble lies in the attempt to simplify something which is complex and not amenable to schematized treatment.

Historical Validity

We come now to one of the most bitter and perhaps the most fundamental arguments over the principles of war: the question of their historical validity. General principles which seek to guide human behavior are of two kinds, either empirical or a priori. The official position is that the principles of war are empirically verifiable. Thus they are usually prefaced by some such sentence as "The principles have brought success in the past and will do so in the future." There is, of course, no logical connection between the first part of that statement and the second. Like the unsupported statement that the principles apply at all levels, times, and places, it has strong a priori undertones.

Many critics would deny that the principles have always or even sometimes brought success in the past, and would say that they are not a summing up of how wars have been won, but are a short statement of how some people think wars ought to be fought. In their view the principles are not empirical but emotive.

To clarify this argument, can one discover how the pioneers set about establishing the principles? There is a certain amount of evidence, not all

of it reassuring. Clausewitz read and wrote a great deal of military history, but the bulk of his work was done at leisure between 1818 and 1831 at the Prussian War College. The "Summary of Instruction" of 1810 is the work of a young and self-educated soldier who had been more or less continuously at war since the age of 12 in 1793. Its simplicity and self-assurance contrast significantly with the qualifications and subtleties of his later papers. Moreover, even in *Vom Krieg*, he has a disturbing habit of alluding to battles rather than demonstrating from them. He may have presumed information in his readers; it would have been safer to allow for ignorance.

Changing Attitudes

Foch, whose list of principles enjoins the destruction of the enemy at all costs, although it differs slightly from the modern list, supports the main part of his doctrines by an examination of a single minor event, the tactics of a small Prussian advance guard of Nachod in 1866. This examination may have been taken second-hand from Kühne. Schlieffen, a devotee of the simpler Clausewitzian ideas, chose Cannae as a convincing precedent for his great encirclement plan of 1905, a battle which makes a pretty diagram but of which we know too little to examine satisfactorily.

Fuller decided to study military history only in 1911, but by 1912 had produced a complete list, which he first published in the *Royal United Service Institution* journal of February 1916. This is an important article because it is the immediate source certainly of the British list and almost certainly of the American list, first officially adopted in 1920 and 1921 respectively, and almost unchanged in 1961. Perhaps the most interesting

thing about it is that it was based solely on a reading of Napoleon's correspondence. He has since written some of the most distinguished military history yet published, but he has abandoned completely the methodic approach to war he advocated so strongly 40 years ago. He has done more than abandon it. He has denounced it in the strongest and most impassioned terms.

None of this convinces one that the pioneers gave their ideas a really sound historical basis. Clausewitz and Fuller both became scholars after they had perpetrated their damaging doctrines. Both later sought to modify them. Foch, faced with real military situations, rejected the methodic approach for that of dealing with problems on their own merits. Schlieffen, by 1907, had abandoned the hope of redrawing the map of Cannae on the plains of Northern France. Finally, no one, to the author's knowledge, has published any large-scale analysis of the principles of war which establishes them satisfactorily on a historical foundation.

Can they be so established? Any tentative attempt to do so at once encounters a false assumption on which they are based. This is that war has a constant nature: that the causes of war, its objects, and the methods men adopt to achieve them are always the same. The propagation of an exclusive list of principles assumes as much itself while their aim of aiding the destruction of the enemy and the statement that they have always applied must mean that all wars have been wars of destruction.

The evidence, however, just does not support this view, which again smacks of the a priori rather than the empirical. Clausewitz himself, in his

chapter "On Examples," comes near to admitting that it is unfounded. He quite rightly comments that recent military history is the best field of study, because it is the best documented, and that ancient military history, of which we know little in detail, is of small value. He goes on to say:

In ancient times, circumstances connected with war, as well as the methods of carrying it on, were different; therefore, its events are of less use to us either theoretically or practically.

Or, in short, it is wrong to pretend that men's loyalties, objects, and methods in war are always the same. They are shaped by society and by the age, by religion, by economic organization. All these change.

Medieval Practices

For example, it would obviously be most misleading to analyze medieval warfare in terms of the principles. Medieval soldiers resorted to all sorts of practices which no modern soldier could bring himself to condone. Bribery and treachery were normal, if not accepted, practices in medieval warfare: it was only by arranged treachery that the First Crusade captured Antioch, the gateway to Jerusalem.

But, more important, was the relation of the military class to society in the Middle Ages. It may be argued that there was a closer loyalty between knights who were occasional enemies than there was between knights and their servile followers, while the motives in war were often completely different, including such uncontemporary impulses as the hope of ransom, the protection of honor, the keeping of oaths, or the relief of boredom. But above all medieval society was concerned with the pres-

ervation of institutions, not their destruction. Since the two great institutions—feudalism and the universal Church—were common to all, there was no focus for ideological or nationalist wars of destruction.

With the rise of mercenary armies, an altogether different attitude animated the conduct of professional soldiers (themselves a new sort of man). Preservation of his stock in trade was, in the last resort, more important than victory to the adventurer captain, and success was measured in spoils rather than settlements. The wars of the late 17th and 18th centuries usually are described as dynastic. They bear little relation to the war of destruction which the principles encourage. They were fought usually for severely limited ends by armies which were almost the private property of the conflicting sovereigns. They were recruited from the highest and lowest class of society so that the people at large felt little involvement in the wars their royal houses chose to fight.

War as an Abstraction

Feudal war, mercenary war, and dynastic war had no place in the earlier ideas of Clausewitz. They were the denial of "true war," whose spirit, Ludendorff said, he kept alive in the Prussian Army. But the violent clash of nation states is no more "true war" than the Wars of the Roses, for "true war" is an abstraction and "war" itself may be little better. If by "war" we mean "all wars," the word is still a useful concept. If we generalize its meaning, its usefulness decreases sharply. There is no such thing as "war"; there are only specific wars. This is why the principles of war are such an unsatisfactory tool of historical analysis. Medieval warfare can no

more be understood in terms of the principles than the feudal system can be understood in terms of modern democratic ideals. Both would lead one to look for aims which were simply not recognized in society at that time.

Effect of New Developments

Change in warfare is the result not only of political and social change but obviously of technical and economic movements also, and of the interaction between all of these. Physical developments are, however, the most obvious and perhaps the most important factor in making wars differ from each other historically. Some historians, notably General Fuller, believe that they are nearly all-important. They are certainly the most obvious for those who have to do the fighting and their effect can be bewildering in terms of new weapons, greater numbers, greater destructive effect, and greater dangers.

One of the purposes behind the principles has been to make new and strange circumstances comprehensible, to draw a thread from one war to another, to force events into a mold, and to make conflicts obey the dramatic unities. This attempt to equate, say, the campaign of Blenheim and the Battle of Normandy may be excused on the grounds that it has helped to minimize commanders' problems, but it is a policy of diminishing returns.

A point is reached in the development of weapons systems beyond which one cannot compare the present and the past. Destructive power and the ability to absorb destruction have seemed to advance more or less evenly, but in our time the line of destructive power has gone off the graph. Our ability to destroy the foundations of society is the new dimension in war-

fare. It did not exist in Napoleon's day. Clausewitz, whose intelligence is analytical rather than imaginative, gives no sign of visualizing the technical and economic changes which were so imminent. Would he have been so dogmatic if he had?

Principles versus Practical Reasons

Accepting that the political revolution which coincided with the formulation of Clausewitz' ideas, and the economic revolution which swiftly followed it make the principles of doubtful value in discussion of the wars even of the 18th century, can one say that conscious adherence to the principles of war has brought success in war since their formulation 150 years ago? The victories of Napoleon (whose methods Clausewitz is said to have codified) and the examples of Sadowa and Sedan seem to suggest that it has. Certainly, it was thought so at the time, as the work of the French and German General Staffs after 1870 proves conclusively.

The largest exercise in the principles of war, fought between 1914 and 1918, was completely sterile and was resolved only by attrition—not a method the principles approve of but, in this case, the direct result of their influence. Both Napoleon's and Hitler's invasions of Russia carefully obeyed all the rules—surprise, offensive action, concentration—and both failed dismally. The defenders of the principles would say, however, there are "good practical reasons" to explain things in these specific cases.

Is it not more satisfactory to look for practical reasons for success or failure in all specific cases, instead of resorting to generalizations about obedience to emotive "principles"? Clausewitz' "Summary of Instruction" of

1810 is based primarily on his observation of Napoleon's campaigns. But Napoleon's successes were due largely to the revolutionary ardor of his armies and to the feebleness and disunity of his enemies. The Prussian victories of 1866 and 1870 were both won against weaker and less efficient armies, in the latter case against a French Army which was not fully mobilized. The German breakthrough in 1940 was achieved by a combination of superior equipment and novel tactical techniques which the Allies at first were not mentally or physically equipped to resist, or indeed even to understand.

The list is perhaps as long as military history. Undoubtedly, some battles have been won or lost by what conventional analysis might describe as obedience or disobedience to the principles of war, but by no means in all cases. Stricter examination usually will reveal harsh material reasons for a commander's or an army's ability or inability to obey the principles of war. Moreover, even if the principles are sometimes valuable in analyzing the course of a battle or even a campaign, they are rarely, perhaps never, capable of reducing the events of a whole war to order. Further distortions which they encourage are an exaggeration of the power of a commander to shape events and a disregard for the effect of those two most valuable Clausewitzian concepts—friction and the fog of war.

A Crude Philosophy

The principles of war, in the last resort, propound a crude philosophy of history, whose main and quite insupportable assumption is that war has an essence which is separate from the acts we would describe as warlike, and so has a unified and constant na-

ture. Unlike most philosophies of history, this one has no literature, but only a set of conclusions. Its vulnerability to criticism is thus diminished, because, as is not the case with Marx or Spengler—to name some obvious examples—there is no corpus of supporting argument which experts can subject to detailed reinterpretation. The effect of this philosophy is the same as that of others. It misleads the serious student, it provides the lazy with predigested interpretations, it substitutes slogans for real historical inquiry, and it distorts the past in an attempt to influence the future.

It is the possibility of the principles influencing future events which prompts one to raise the most serious objection to them. It has been shown that the assumptions on which the principles are based—that war has a constant and unified nature and that its aim must be the destruction of the enemy—are false and that the empirical foundation of the principles does not survive serious examination.

The situation can perhaps best be condensed thus: The principles were consciously applied for about 150 years from 1800 onward by the leaders of disciplined European armies supported by large reserves of manpower and material fighting, usually in Europe, in the interests of European power politics. The military aim of each army, because of a complex of social and political aims, was to destroy the other. Their comparatively limited, if continually increasing destructive, capability encouraged them to adopt a set of rules which helped to conserve precious firepower until it could be discharged intact upon the battlefield. Indeed, it would not be fanciful to describe it as an age of military mercantilism.

Limiting Destruction

This is, of course, an oversimplification. There were many limited wars during the period, and even if the idea of total war was accepted generally, which it was not, the weapons and economic resources available were not capable of its realization. However, developments in political attitudes and in technology moved steadily toward that end. These developments culminated in the Allied decision of January 1943 to fight for unconditional surrender, and in the successful detonation of the first atomic bomb in July 1945.

It would be altogether too obvious to comment upon the swiftness with which the idea of total war lost favor almost everywhere. The successful explosion of an atomic bomb by the Soviets in 1949 and the successive advances in its destructive power, range, and accuracy of delivery, and the ease and cheapness of manufacture made by both the Soviet Union and the United States since then, have been matched by successive retreats from the extreme political position arrived at only a few years ago. Firepower, far from being scarce, has suddenly become a superabundant commodity. The prospect of two nations solemnly declaring total nuclear war upon each other is ludicrous. However tense the relations of East and West today, and however unlikely the possibility of abolishing violence in international relations, total war—except in the form of surprise attack or preemptive attack—is not viable politics. The problem which exercises modern commanders is not that of finding ways to destroy the enemy, in which the principles were so useful, but of limiting the almost total destruction which nations can so easily visit upon each

other. This necessity runs quite counter to the whole spirit of the principles of war.

It also runs counter to a number of strong emotional attitudes which support the aim of the enemy's destruction as the obvious end in warfare. These emotions have helped to retain the principles as official doctrine, even though they conflict with other official teachings about the alternative forms of war for which the development of nuclear weapons systems has forced armies to prepare. Among these is an acceptance of a vague, law of the jungle determinism, a belief that unless you destroy the enemy, he will destroy you.

Another emotional attitude is that which preaches the virtues of activity, of seizing the initiative almost for the sake of it. This is often expressed in the jingle, "When in doubt, hit out," an attitude closely allied to that which exalts the power of the will to achieve success in the face of material opposition.

Perhaps the commonest and most understandable of these positions is that which looks for simple, total solutions. Men like to know where they stand and what they have to do in a difficult situation. Thus the destruction of the enemy is a satisfying aim in war. One of the most unfortunate effects of the invention of nuclear weapons is that it has made the satisfaction of emotions a luxury which no one can afford. We can no longer fight large wars and settle down to enjoy the peace. Instead, we have to accept an uncomfortable and apparently permanent state of neither war nor peace which demands a high level of vigilant military preparedness but a correspondingly uncomfortable degree of permanent self-control.

Of course, if a country did determine to launch a total nuclear war against another, despite the clear moral objections and strong practical arguments against such behavior, the plan would take the form of a textbook application of the principles of war: a concentrated attack, without warning, against the enemy's retaliatory power. Indeed, in helping to form a picture of what such a war would be like, the principles may still be of some use, although their tendency to encourage the adoption of a total war strategy must also be appreciated.

Irrelevance to Limited War

It is, however, most doubtful whether the principles are relevant to limited nuclear war. Limited war, as Dr. Brodie has pointed out, depends not upon the limitation of objectives but upon the limitation of means. The principles of war were the product of an age in which, although the will to destroy the enemy was present, the means were not. The object of the principles was to assist the commander to make the fullest use of what resources he had. This is why Napoleon, and all who followed him, laid such emphasis upon the moral basis of victory. Neither Napoleon nor even Foch could hope to kill everyone in the hostile army, but the moral effect of the casualties they inflicted would cause the unwounded majority to break and run, or so it was hoped.

Maximization of means is the real message of the principles and one's conclusion must, therefore, be that an orthodox application of the principles to limited war would sharply increase the chance of escalation. There are also a number of specific irrelevancies. What agreement there is about the form limited nuclear war should take stresses the importance of limiting

the size and range of nuclear explosions, avoiding strategic military targets, and keeping channels of communication open with the enemy. This sharply compromises the principles of offensive action and surprise. Again, at a tactical level, one simply cannot maintain that such a principle as concentration still applies when troops are trained in the technique of dispersion, or reconcile the doctrine of economy of force with the equality of effort which this dispersion will force upon the defense.

Application to Conventional War

It is equally debatable whether the principles apply to conventional war today. Events in Korea and Indochina seem to show that it is potentially as escalatory as any kind of limited war if a real effort is made to destroy the forces of one side or the other. Once the conventional "war of the principles" is abandoned, as it was during the years of the armistice talks, military activity must become simply a method of influencing diplomatic negotiations.

Political control over military operations will then descend to the level of patrol activity. Even platoon attacks, which properly reflect the application of the principles of war on a minor scale, may be circumscribed for political reasons. Under these conditions, war becomes what it should always be: a form of international relations in which the political and military objectives are identical, and

political and military activity complement each other. It is a kind of war which demands subtle responses, patience, self-control, firmness but not ruthlessness, and an ability to settle for something less than total victory.

War Is What We Make It

It is an odd situation in which the Principles of War are not the principles of war, but war is, after all, what we make it. If we remember the genesis of the principles, and learn to look at them in their historical setting, we shall then be able to see more clearly how little they have to offer in the solution of contemporary defense problems. It is always tempting to pretend that things are less complicated than they seem. The apparent ability of the principles to guide men in war through its barrage of physical pressures and maze of alternative choices has given them a strong and understandable appeal. But the days of the simple soldier and of quick, final decisions are gone. War, even more than politics, has suffered from bad historians, bad commentators, bad prophets, and bad teachers. The principles of war are an example of their work. At a time when military studies are ridding themselves of the demons of the past, it is a pity that these primitive maxims, with all their limitations and all the bad advice they proffer, should survive to contradict so much of the good sense that modern soldiers learn and talk.

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Origin of the Metric System

Lieutenant Colonel Oskar Albrecht,
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Beginning January 1962 the United States Army will use the metric system for the measurement of linear distances in most tactical and administrative support activities. Here is an article by a German authority on the origin of the system. Lieutenant Colonel Albrecht was employed in the Geodetic Office of Land Baden-Württemberg until 1956. Since that time he has served in the Federal Army of West Germany.—Editor.

NATURAL measures, mostly human limbs, have been the basis for linear measuring units since ancient times. The Assyrians and Babylonians used the "hand's breadth" and described four hands' breadth as an "ell." The ell was renamed a "foot" and around 500 B. C. it spread from Egypt to Greece and Rome. It is still used in many nations.

The standard measure of the foot

was kept in Rome as an official measuring unit for the Roman Empire. The Romans used the "double step," 1,000 of which made a "mile" for the designation of distances. In the Middle Ages, new linear measures such as the rute (12.36 feet), the schuh (11.81 inches), the span (nine inches), and the klafter (1.90 yards) were added.

Individual nations developed standard miles, each of which was different. Separate standards for geographical and nautical miles further complicated the situation. As a multitude of standards developed, they were rarely arranged into systems and more rarely

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into the framework of a decimal system. The standards for linear measuring units were so diverse that each small political subdivision, sometimes even individual towns, had their own standard foot units. In the German language sphere there were more than 100 different foot units all of which varied from today's foot. They ranged from 0.25 to 0.37 meters.

The jumble of measuring units imposed considerable difficulties on trade and technology. The need for reform and the establishment of uniform standards became more and more urgent. France, the leading nation in technical science in the 17th and 18th centuries, took up the matter during the reign of Louis XIV. The Académie des Sciences founded in 1666 is credited with the creation of our present metric system.

The Creation of the Meter

Abbé Mouton, a scientist of Lyons, and the astronomer Cassini proposed, at the beginning of the 18th century, to base the system upon a natural standard such as a part of a meridian of the earth. This required accurate terrestrial measurement, and in 1735 the Parisian Academy sent expeditions to Lapland and to a location near the equator in Peru to measure the oblate surfaces of the earth.

As a result of their observations, the *Toise de Pérou* was created and declared the legal linear standard for France by Louis XV. For about 100 years prior to the general adoption of the meter, the Peru *toise* was the standard for international measurements.

The Academy of Natural Science devoted its efforts in the following years to the creation of a basic measuring system which could be used for measurements of length, mass, and

volume. An engineer officer, Prieur-Duvernois, submitted a resolution to Talleyrand, the President of the National Assembly, for the adoption of a new comprehensive measuring system with decimal graduation. The resolution was approved by the National Assembly on 8 May 1790 and confirmed by King Louis XVI.

A commission determined that the new linear unit was to be one 10-millionth part of the earth's meridional quadrant and would be named a *mètre*. A list of the new linear measure standards was submitted to the National Assembly in 1792, and King Louis XVI authorized their use shortly before his arrest and execution. Thus the cornerstone for the metric system was laid; however, it was a long time before it came into practical use.

A French law of 10 December 1799 established the "legal meter" as the basis of standard measurements. This day may be called the birthday of our present metric system. In spite of the turmoil of the French Revolution, this progressive program of the Parisian Academy of Natural Science had been brought to a successful conclusion. A medal commemorating the occasion bore the inscription, *A tous les temps, à tous les peuples* (For all times, for all people).

Without delay a prototype was constructed. It is a platinum bar known as the *mètre des archives* and is kept in the French National Archive. It is an end measure, that is, the measuring unit is defined as the distance between the two end surfaces at the temperature of melting ice.

Later it was found that the soft platinum of the archive meter was not suitable for the production of copies and comparison with other bars. For this reason copies of the Peru *toise*

were still used in the first half of the 19th century. These were converted to metric standards by mathematical equation.

The Metric Convention

During the course of restoration, France adopted a metric foot equal to 0.30 meters and a metric ell equal to 1.2 meters. The adoption of these units was an effort to retain the old units of measure while adapting to the new system.

The remaining European states were slow in accepting the new system. But science, technology, and commerce urgently demanded a uniform international regulation.

At the World's Fair in 1867 the existence of a variety of measurement units and systems became especially apparent. A committee of 21 participating states recommended to their governments the adoption of the metric system.

In 1870 the French Government called the "International Metric Commission" to Paris for the purpose of perfecting the system.

After the technical details were settled, the "Convention of the Meter" was signed by 17 states in 1875. It provided for the adoption of the metric system as of 1 January 1876 and provisions were made for an International Bureau of Weights and Measures to construct new standards and distribute them to the signatory nations.

A new prototype was to be constructed. The meter was no longer to be defined as a part of the meridian, but was to be a conventional measurement fixed by agreement. It was to be defined by the distance between two fine lines engraved across a metal bar when the bar is at a temperature of melting ice (zero degrees centi-

grade). This bar defines the meter unit still in use. It is deposited in the vault of the International Bureau of Weights and Measures at Breteuil (Sèvres near Paris). Comparison measurements are possible to 0.02 micron. At the present time, 35 countries belong to the convention.

Propagation of the Metric System

During the 19th and 20th centuries, a number of states adopted the metric system independent of the international agreement of the Metric Convention: Belgium in 1820, Germany in 1872, the Soviet Union in 1918, China in 1929, and Turkey in 1934.

In Europe, all countries, with the exception of Great Britain and Ireland, adopted the metric system. There the so-called British measurement units are still in official use. The same applies for Australia, Burma, India, Canada, New Zealand, and the Union of South Africa. The United States legalized the metric system on 28 July 1866; however, the British measure units are still being used. Only a few countries—for instance, Egypt—use systems of their own which are neither metric nor British.

Later Definitions of the Meter

One of the main tasks of the International Bureau of Weights and Measures is to verify the reference standards and the national standards.

The Seventh General Conference of the Metric Convention in 1927 approved a definition based on wave lengths of red cadmium radiation as a secondary standard, but the Tenth General Conference in 1954 resolved not to change the definition of the meter. At present, our physics books clearly state "the meter is the distance between the two lines engraved on the prototype meter bar of platinum-iridium kept in Paris."

This article is based on a lecture Dr. Morton delivered at the United States Air Force Academy. He is a recognized authority on the history of World War II and has contributed extensively to the series The United States Army in World War II.—Editor.

IN THE days when rulers commanded their own forces or delegated the task to their trusted advisors, there was no problem of command or differences among competing services. The ruler or his chosen deputy commanded all the forces afloat and on land. Seaborne or amphibious operations posed special problems, it is true, but in no way diminished the authority of the commander.

Alexander, when he sailed for Asia Minor, and Caesar, when he crossed the English Channel, commanded at sea as well as on land. When Belisarius, perhaps the greatest general of the ancient world, sailed from Constantinople with an army of 5,000 horse and 10,000 foot in 500 transports to assault the maritime supremacy of the Vandals and Carthaginians in North Africa, the Emperor Justinian conferred on him, Gibbon tells us, "supreme command, both by land and sea . . . with a boundless power of acting according to his discretion, as if the Emperor himself were present."

As seapower came into its own and navies acquired their own doctrine and organization, the military and naval professions became distinct and separate. By the time of Drake and even as late as the days of Robert Blake and George Monck, a man could still be part soldier and part sailor, a sort of general-at-sea. But responsibility for joint operations was already being divided. So specialized



and technical had the naval profession become by the start of the 18th century that no ground officer was considered competent to direct surface forces under any circumstances. The army was supreme on land, the navy at sea, and when the two acted together, elaborate arrangements had to be made to preserve the sovereignty of each in its own sphere and to guarantee the cooperation of the commanders concerned.

Cooperation was the key to success in joint adventures; service rivalry the sure road to disaster. When General Wolfe set out for Quebec in 1759, he was enjoined to cultivate good relations with his naval counterpart, for, warned the Crown, "the success of this expedition will very much depend upon an entire Good Understanding between our land and Sea Officers. . . ."

These instructions, written 200 years ago, have a curiously modern ring, for they embody the principle of command by cooperation that prevailed at the start of the Second World

ND IN THE PACIFIC: 1941-45

Louis Morton

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War. In the Philippines, all Army forces, including the Army of the Philippine Commonwealth, were under General MacArthur; naval forces were under Admiral Hart. There was no independent air command, for the Air Force was then a part of the Army. Similarly, in Hawaii there was an Army command, headed by General Short, and a Navy command, the Pacific Fleet, under Admiral Kimmel. In both Hawaii and the Philippines the Army and Navy commanders were independent of each other and reported only to their superiors in Washington. Command was by cooperation, and each viewed cooperation in his own way.

The inadequacies of such an arrangement and the danger of divided responsibility had been recognized before the war. But all efforts to establish unity of command were wrecked on the sharp reefs of service jealousy. Neither service was willing to place its forces under the command of the other, even for a limited purpose, and

neither would admit the necessity for so drastic a step. Apparently, they believed firmly in the adage, "When two men ride the same horse, one must sit behind."

Effect of Pearl Harbor

The disaster at Pearl Harbor provided the pressure needed to overcome resistance to unified command. Clearly, the emergency was great and time pressing. Still the services balked until President Roosevelt moved in. Determined that there should be no repetition of the confusion of responsibility that had existed in Hawaii, he told the military and naval chiefs that if they did not establish unified commands where they were needed, he would do so himself. Action followed quickly and on 17 December Hawaii was placed under a unified command, with the top post going to the Navy. At the same time, there was a complete turnover in the high command. Rear Admiral Chester W. Nimitz was jumped two grades and appointed in Kimmel's place. General

Emmons, an air officer, replaced Short who came home with Kimmel to face the ignominy of relief and retirement.

Unity of command in the Philippines was not established until the end of January, after the decimated Asiatic Fleet and the Far East Air Force had left for Australia and the Indies. What MacArthur needed, once the Japanese had landed, was not control of a nonexistent Navy and Air Force, but reinforcements. It was this need that led to the creation of the first US overseas command of World War II.

The architect of this new command was Brigadier General Dwight D. Eisenhower. Brought to Washington after Pearl Harbor because of his experience in the Philippines as a member of MacArthur's staff, he suggested to General Marshall that the troops in a convoy of seven ships then on the high seas headed for Australia be made the nucleus of a command to be called US Army Forces in Australia. General Marshall approved the plan, thus inaugurating the great American buildup in Australia, and, incidentally, Eisenhower's meteoric rise in World War II.

This new command consisted entirely of US Army ground and air

forces, and was neither joint nor unified. Nevertheless, its creation is an important part of the story of the Pacific command, for it provided the basis on which a unified command—comprising not only American air, ground, and sea forces but Australian and Dutch, as well—was later constructed.

The ABDA Command

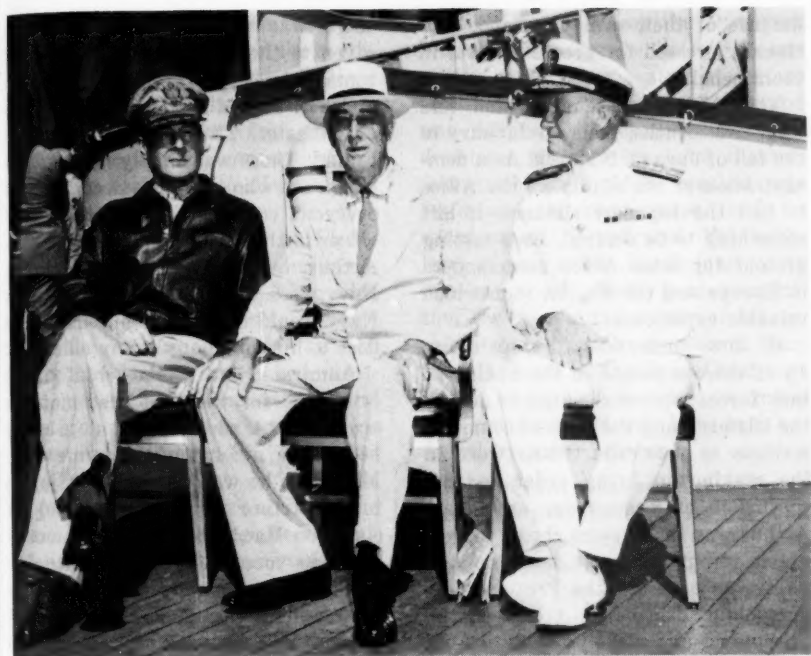
The first Allied command, like the first American command, also came in the Pacific. It was known as ABDA—the initials of the national forces involved: American, British, Dutch, and Australian—and grew out of the need for a combined Allied staff to coordinate the efforts of the scattered forces opposing the Japanese advance into Burma, Malaya, the Indies, and northwest Australia. In a real sense, the ABDA command was Marshall's creation. Firmly convinced from his experience in World War I that unified command was essential for combined and joint operations, he told the British Chiefs of Staff then meeting in Washington that:

If we make a plan for unified command now it will solve nine-tenths of our troubles. . . . A man with good judgment and unity of command has a distinct advantage over a man with brilliant judgment who must rely on cooperation.

Marshall had his way and the British agreed to establish the command. But who would be the supreme commander? Possibly because no one could foresee any outcome but disaster, the British wanted an American to command, the Americans an Englishman—specifically General Wavell. Again the Americans won out and Wavell was named to the post.

Defining General Wavell's authority presented a difficult problem. He had

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US Army

President Franklin D. Roosevelt, General Douglas MacArthur, and Admiral Chester W. Nimitz at a strategy conference during World War II

to be given enough authority to exercise effective command, yet not enough to threaten the interests of the nations concerned. Thus he was given command of all forces "afloat, ashore, and in the air," but permitted to exercise that control only through subordinate national commanders whom he could not relieve and who had the right to appeal to their governments. Further, he was required to appoint officers from each of the participating governments to his staff and to the major commands. Thus his deputy and naval commander were Americans, the air commander British, and the ground commander Dutch.

This effort to strike a balance between unified command and national

interest was not altogether successful. Almost from the start national differences created problems, which the senior commanders discussed freely with their own governments. To the Americans, Dutch, and Australians it seemed that Wavell was devoting far too much attention to the defense of Malaya, Singapore, and Burma, an attitude that seemed to them to reflect British rather than Allied interests. The American commanders, Admiral Hart and General Brereton, free from any territorial interest in the area, wished to concentrate on the lines of communications. The Dutch desired above all else to use Allied resources for the defense of the Indies. The Australians, concerned over the

defense of their own homeland, continually pressed for greater efforts in their behalf.

The ABDA command lasted less than two months, from 15 January to the fall of Java on 9 March. As a demonstration of the ability of the Allies to halt the Japanese advance, it left something to be desired. As a testing ground for later Allied commanders in Europe and the Pacific, it provided valuable experience.

By now commands were springing up at various points in the Pacific as task forces were rushed out to defend the islands along the lines of communications to Australia. Plans were in the making to bring order to this confusion of commands, and MacArthur was the obvious choice for supreme commander—at least to the Army. As a result, the President ordered him to leave his troops in the Philippines and make his way to Australia for an assignment not yet known.

Reorganizing the Pacific Area

Thus far the command arrangements had been emergency measures taken in response to the Japanese threat and bearing no relationship to any broad strategic concept. Clearly, something more permanent was needed if the Allies expected eventually to take the offensive against Japan. The task of fashioning such an organization fell to the United States which, by common consent of the Allies, assumed primary responsibility for the Pacific theater. By mid-March, the planners of the War and Navy Departments, after numerous disagreements and prolonged discussions, had drafted plans for the organization of the Pacific theater.

A variety of schemes were discussed by the planners but, oddly enough,

there was no serious consideration given to the appointment of a single commander, operating under the principles of unified command, for the entire theater. The reason is not hard to find. There was simply no available candidate who would be acceptable to everyone concerned. The outstanding officer in the Pacific was General MacArthur, but his differences with the Navy were well-known. Certainly, the Navy would never have entrusted the fleet to him or to any Army officer.

Admiral Nimitz, the chief naval candidate for the post, had not yet acquired the popularity and prestige he later earned in such large measure. Moreover, he was considerably junior to MacArthur. If the Army had insisted on MacArthur's appointment to supreme command, or the Navy on Nimitz', the planners would never have reached agreement. By mutual consent they avoided the issue altogether. The only reasonable alternative was to create two commands, and this the planners did.

Geographic Division

This was only the beginning of the problem. If there were to be two commands for the Pacific theater, how would it be divided? By a line drawn in the center, from north to south? Or from east to west? Was there any logical basis for an equal division? The Navy's idea of such a division was to create two areas, an Australian Area and a Pacific Ocean Area. The first, to be commanded by an Army officer, would include Australia, New Guinea, the Netherlands Indies, and the Solomons. The second would be under the Commander in Chief, Pacific Fleet, and would include the rest of the Pacific, an arrangement that would have given the Navy a large slice of the Ocean indeed. The

idea behind this division was that Australia and her approaches on the north-east and northwest formed a strategic entity. Her defense should, therefore, be separate and distinct from the defense of the line of communications stretching eastward to Hawaii and the United States.

The Army planners, led by Eisenhower, showed no disposition to accept the Navy's argument. Their idea of an equitable division was to place all of the Pacific south of the line Philippines-Samoa under one command, presumably MacArthur; and everything north and east of the line under a naval commander. This would give MacArthur not only Australia and her approaches, but also New Zealand, a portion of the line of communications, and, most important, the Philippines.

The result was a compromise. General MacArthur was made Commander in Chief of the Southwest Pacific Area, which included Australia, the Philippines, New Guinea, the Solomons, the Bismarck Archipelago, and all of the Indies except Sumatra. The remainder of the Pacific was organized into the Pacific Ocean Areas under Admiral Nimitz, and divided into three subordinate areas. Two of these, the Central and North Pacific, Nimitz could retain under his direct control. The third, the South Pacific, would have its own commander, a naval officer responsible to Nimitz.

Two Separate Commands

This organization did not establish a unified command for the entire Pacific, but rather two separate area commands. Control over the theater as a whole was vested in the Joint Chiefs of Staff, which became in effect the directing headquarters for operations in the Pacific. But that body lacked

a single head—except the President himself—and operated under a committee rather than a staff system so that even in Washington command was diffused and decentralized, and decisions on strategy and theater-wide problems could be reached only by debate and compromise. Such an arrangement complicated the problems of war in the Pacific and led to duplication of effort, keen competition for the limited supply of troops, ships, planes, and landing craft. Further, it placed on the Joint Chiefs the heavy burden of decision in many matters that could well have been resolved by lesser officials.

Within each area, however, unity of command prevailed. MacArthur and Nimitz reigned supreme in their own spheres, subject only to the Joint Chiefs and the rules that governed unified command. Each controlled ground, sea, and air forces, decided how they would be used, appointed subordinate commanders, and had complete authority in all matters except the internal administration of his forces.

Of the three subordinate areas of Admiral Nimitz' command, the South Pacific presented the most immediate problem, for it was from there that the first Allied offensive would come. Selected to command this area initially was Vice Admiral Robert L. Ghormley. Like Nimitz under whom he served, Ghormley was supreme in his own domain. Not only was he area commander but also commander of all naval elements in the South Pacific. He exercised both commands through a staff that was essentially naval in character. Of 103 officers assigned to his headquarters in September 1942, only three wore the Army uniform. All the major commands in the theater

were under naval officers and had predominantly naval staffs.

The need for an Army command in the South Pacific could hardly be denied. Army troops in New Zealand, New Caledonia, the New Hebrides, the Fijis, and elsewhere had been rushed out so quickly that there had been no opportunity to perfect arrangements for their support and control. Supply of these forces was cumbersome and inefficient, and responsibility divided. A base commander might report directly to the War Department, get his supplies from California or Australia, and take his orders for airfield construction, possibly his most important task, from General Emmons in Hawaii.

Problem of Army Aircraft

Control of Army aircraft was also a problem in the South Pacific. Ghormley's command, despite its theoretically joint character, was naval, and the air commander was an admiral. Army aircraft thus came under naval control for operations. This could not be avoided under the principle of unity of command, distasteful as it may have been to the airmen. When it became apparent that the air commander of the South Pacific would also be responsible for training, the Army objected. Air forces, it held, should retain their identity, be assigned appropriate missions, and execute them under their own commanders in accordance with Army Air Force doctrine.

To meet this problem as well as the problem of supply and administration, the War Department in July 1942 established under Ghormley a new command—US Army Forces in the South Pacific Area—and assigned as its commander Major General Millard F. Harmon, then Chief of the Air Staff. General Harmon, in turn, chose for his

staff highly trained airmen—Nathan Twining as Chief of Staff, Frank Everest, Dean Strothers, and others—a clear indication that the new headquarters intended to uphold the interests of the Army Air Forces in this predominantly naval area.

With the appointment of Harmon, the structure of the Pacific command was virtually complete. The limits of the theater had been set, the boundaries between areas drawn, commanders named, and lines of authority delineated.

Although it had proved impossible to reach agreement on a single commander for the entire theater, unified commands had been established for each of the areas, and the principle of unity of command extended downward to subordinate areas and major task forces. Much remained to be done to make these commands effective and representative of the services, for Nimitz' headquarters was essentially naval, and MacArthur's Army. Both still had to demonstrate whether they could overcome traditional service differences and points of view to forge a truly unified command capable of acting with singleness of purpose and spirit.

Testing the Command Structure

The Guadalcanal campaign, launched from the South Pacific early in August 1942, provided the first real test of unified command. Differences arose almost immediately. General Harmon did not think Admiral Ghormley was doing all he should, especially in the matter of airpower. Ghormley, on his part, complained of the Army's support.

Logistics, too, proved a troublesome problem, especially since each service maintained its own supply system.

After a trip to the area, General Arnold reported to Marshall "that the Navy had not demonstrated its ability to properly conduct air operations," and that its failure to appreciate the importance of logistics had led to serious shortages in the combat zone.

General Marshall and Admiral King did what they could to iron out the differences in the theater, but there was a limit to what they could do. Each service had its own way of doing things and its own point of view, the inevitable result of a lifetime spent in learning the business of being a soldier or a sailor or an airman. To expect them to overcome these differences in a few weeks was unrealistic; it would take months and perhaps years to create a truly interservice point of view, if it could be done at all.

General Marshall recognized this very quickly, and accepted it philosophically as the major obstacle to unified command. Since there was no way of overcoming it short of an extended period of retraining, he sought to diminish its effect by placing Army officers on the staffs of naval commanders and sponsoring the appointment of naval officers to Army staffs. In this he had only limited success, for in the final analysis, the relations between commanders, not their staffs, governed the effectiveness of cooperation between the two services.

Challenge of the Solomons

The Guadalcanal campaign had scarcely reached its close when the division of command so carefully drawn six months earlier was sharply challenged. Under the original agreement the South Pacific commander would conduct the Guadalcanal campaign; succeeding operations in the Solomons

were to be under MacArthur's strategic direction since they would be fought in his area. But when the time came to plan these operations, the Navy sought to alter this arrangement so as to give Admiral Halsey, who now commanded the South Pacific, complete control of these operations, subject to Nimitz not MacArthur.

The battle for command was fought out in Washington between the Army and Navy planners and in the chambers of the Joint Chiefs. The Navy men argued that command was inseparable from control of the Pacific Fleet. To place Halsey under MacArthur would, in effect, give him control of the fleet, and this they were not willing to do. The Army's argument was that Halsey would still direct the fleet; that MacArthur would have only strategic direction, not operational control.

The debate continued for several months, while planning for the operations continued. Until the command problem was settled, however, such planning remained tentative. Neither side would give way, for the real issue was not operations in the Solomons but command of the entire Pacific. The Navy, with its strong traditional orientation toward that area, felt—perhaps with justice—that it should have this command.

Bitterly, Admiral Cooke wrote that the Navy had recognized the Army's priority in Europe and given it unified command there. Now, he declared, it was up to the Army to do the same for the Navy in the Pacific. But the Army would not budge and in the end the Navy gave in. It could do nothing else without precipitating a conflict that could be resolved only by the President.

Admiral Nimitz' Two Hats

The Navy had its turn. When the time came in the summer of 1943 to open the offensive in the Central Pacific, the Army found itself protesting the role assigned to its forces in Admiral Nimitz' area. The most important fact about the command in that area was the admiral's own position. His role as commander of the Pacific Ocean Areas was clear.

Nimitz, however, wore two other hats. He was also the Commander in Chief of the Pacific Fleet and the Commander of the Central Pacific, and when he issued an order it was not always possible to tell which hat he was wearing. Moreover, he used virtually the same staff for all three commands. This was an economical and sensible arrangement, perhaps, but one which Army officers found little to their liking since this staff consisted almost entirely of naval officers and functioned much like a fleet staff. What ought to be done, they said, was to give Nimitz a joint staff with adequate representation from each of the services, and to divorce him from his fleet and his Central Pacific commands. This would leave him only his theater command, and place him in much the same position as MacArthur.

The Navy staff in Washington stoutly denied the need for a change, and asserted that existing arrangements had worked well for the past 18 months. Nor could Admiral Nimitz see any advantage in a separation of his functions or a change in his staff. When he organized his forces for offensive operations in the summer of 1943, he adopted the usual naval task force pattern. The top command went to Admiral Spruance, with the combat elements grouped into

three subordinate commands: Amphibious Force, Fast Carrier Force, and Land-Based Air Force—all headed by admirals.

Under the circumstances, differences were to be expected. The Army commander in the theater, General Richardson, protested the Navy's control of Army aircraft. He was trying to establish the principle that the Army Air Force should command its own units in the coming offensive. Only in this way, he said, would it be possible to ensure the proper and effective employment of Army aircraft in accordance with Army Air Force doctrine. This argument, similar to the one General Harmon had successfully impressed on Halsey during the Guadalcanal campaign, apparently convinced Admiral Nimitz and he finally gave in.

Control of Army ground troops scheduled to participate in the Gilberts operation also caused difficulty. The 5th Amphibious Corps headed by the Marine General Holland Smith had responsibility for amphibious training of all troops. In addition, Smith commanded the ground forces for the Gilberts operation. This dual command raised all kinds of questions about responsibility and relationships, and Richardson, seeking clarification, asked Nimitz who controlled the training of Army troops—the Army or the Marines?

Nimitz' answer, although lengthy, was clear. Holland Smith did. Richardson then turned to Marshall for help, but received none. Troops earmarked for specific operations, Marshall told him, would pass from his command at Nimitz' discretion, presumably but not necessarily after consultation with him.

If Richardson received no support

from Marshall at this juncture, it was not because the Chief of Staff was unsympathetic, but because he was determined to make the command in Hawaii, with all its imperfections, work. Although he told Richardson, in effect, that he would have to get along with Nimitz, he continued to push King for a joint staff that would give the Army a larger voice in the affairs of the Central Pacific.

Admiral Nimitz Forms Joint Staff

Perseverance finally had its reward. On 6 September, after nearly four months of discussion, Admiral Nimitz announced the formation of a joint staff—to be headed by his deputy commander, a vice admiral—and to consist of officers from both services. "It would seem," King exulted, "that we are in a fair way of setting up an adequate staff organization out there."

The Army was not so optimistic. General Somervell did not think such a staff would solve the command problem in the Pacific, and General Handy thought Nimitz should have named two deputies, one of them an Army officer. General Marshall was somewhat more generous. The establishment of a joint staff, he told King, was definitely a step in the right direction, but he thought there was room for improvement. His goal was still a reorganization of the Pacific Ocean Areas that would divorce Nimitz from his area and fleet commands, leaving him free to assume the proper functions of a theater commander. But he recognized that there was little chance of securing such a change. The Navy had conceded as much as it intended to in the Pacific.

Planning for Invasion of Japan

Except for the reassignment of the forces in the South Pacific when their

combat mission was completed, there was no major change in Pacific organization or command until the spring of 1945. By that time, Allied forces under MacArthur had fought their way up the Solomons and New Guinea into the Philippines, and those under Nimitz across the Central Pacific as far west as Okinawa.

Plans for the invasion of Japan were being made, and it was becoming increasingly clear that the area boundaries established in 1942 were obsolete and would have to be changed. What would happen after MacArthur recaptured the Philippines? Under the original directive, his area extended only as far north as these islands. Once they were taken, he would have no further combat mission. To place him under Nimitz was out of the question; to rule him out of the war on a technicality was obviously absurd.

It was equally absurd in the Army's view to entrust the 40 or 50 divisions and the thousands of planes required for the invasion of Japan to the overall control of an admiral. Moreover, the division of forces between two independent and separate commands, no matter how equitable the distribution, imposed a degree of rigidity and inefficiency in the use of these forces that might have been excusable in the early days of the war but was inadmissible for operations on the scale required for the defeat of Japan.

Consideration of a Supreme Commander

The most logical solution, of course, was to name a single commander for the entire Pacific with separate air, ground, and naval commands. Everyone was agreed on this, but no one quite knew how to overcome the formidable obstacles in the way of such an arrangement.

During the Guadalcanal campaign,

General Arnold, distressed at the lack of coordination and cooperation he found in the theater, thought the time had come to appoint a supreme commander. He nominated three candidates for the job: General MacArthur, Lieutenant General Joseph T. McNarney, Marshall's deputy; and Lieutenant General Lesley J. McNair, commander of the Army Ground Forces. He recognized that there would be powerful opposition to such a move, but thought it could be overcome if the President himself could be persuaded to make the change.

What General Marshall thought of Arnold's suggestion we do not know. All he did was pass it on to his staff without comment, at least none that is recorded. There it was studied by General Streett and General Wedemeyer. Both approved of the idea and felt Marshall should take it to the President for decision. To Arnold's list of candidates, Wedemeyer added Arnold's own name as the first choice for the job.

The real problem, of course, was to select a commander acceptable to the Army and Navy. For the Army that choice was limited to MacArthur, and the Navy would certainly oppose his appointment. Whether it would accept any other Army officer was doubtful, but assuming that it did, what would happen to MacArthur? Any move to relieve or reassign him would have political repercussions that might well affect the war effort. Any attempt to subordinate him would most likely evoke a storm of protest from his ardent admirers.

General Streett thought he had the answer. Why not give MacArthur some high political post, he suggested, such as the ambassadorship to Russia? That was, in his words, "a big

enough job for anyone." With MacArthur off the scene, Streett continued, the post of supreme commander could be given to either Nimitz or McNarney, depending on whether the Navy or the Air Forces was considered to have the dominant role in the war, and the theater reorganized along more efficient lines.

Nothing came of all this. Apparently Marshall did not wish to precipitate a fight over command and did not, so far as we know, raise the problem with the Navy or with the President.

General Marshall Not Available

Curiously enough, among all the candidates proposed for supreme commander, none had put forward the one man who might conceivably have been acceptable to the Navy, and whose appointment the MacArthur supporters would have found difficult to oppose. That man was George C. Marshall, and in the fall of 1943 this possibility was seriously considered in connection with the appointment of a supreme commander for Europe. Marshall had already been tentatively selected for that all-important assignment, which ultimately went to Eisenhower, and there was serious consideration of the effect of such an appointment on the Pacific command, and whether the acceptance of one would not prejudice the other.

As events turned out, Marshall was unavailable for either. The President leaned on him heavily for advice and was reluctant to let him go. Like a good soldier, Marshall accepted his fate, and remained in Washington for the rest of the war. Had he not done so, the progress of the war in the Pacific might well have taken a different course.

With Marshall out of the picture,

all hopes for establishing a single Pacific command disappeared. Thus when the time came to make definite plans for the invasion of Japan—an operation that would require all the resources of the Pacific and more—no one seriously raised the question. Yet to continue the present arrangement was obviously impossible.

The task of working out a solution to this problem took many months and the record of the discussions on the subject covers many hundreds of pages. Naval leaders proposed the creation of an additional area in the Pacific to include the Japanese home islands, independent of both MacArthur and Nimitz, and responsible directly to the Joint Chiefs. Who would command this area, they did not say. But whoever he was, he would not command the naval forces in the invasion. That assignment, the Navy stated explicitly, would go to Nimitz.

General MacArthur's Proposals

The Army's position on the reorganization of the Pacific for the final stages of the war was based largely on proposals made by MacArthur. All US Army forces in the Pacific, whatever area they were in, MacArthur recommended, should be placed under a single Army command. Similarly, naval forces should be under their own Navy command, and the two should report directly to the Joint Chiefs. This change, MacArthur carefully explained, would apply to US forces; Allied forces would remain under the area commands, which would be retained for that purpose, an arrangement that favored the Southwest Pacific since Nimitz had few Allied troops.

What MacArthur was proposing, in effect, was the abolition of the unified commands created in 1942 and a re-

turn to the principle of mutual cooperation. Under such an arrangement Nimitz would lose control of Army troops and resources in his area, as MacArthur would of Navy forces. But Nimitz' loss would be by far the greater.

Pacific Command Today

The manual Unified Action Armed Forces (UNAAF), JCS Pub 2, defines a unified command as "a command with a broad continuing mission, under a single commander and composed of significant assigned components of two or more Services, and which is established and so designated by the President; through the Secretary of Defense with the advice and assistance of the Joint Chiefs of Staff or, when so authorized by the Joint Chiefs of Staff, by a commander of an existing unified command established by the President." Today, the Pacific command, one of five unified commands established on the basis of geographic area, embraces most of the territory in which the Pacific campaigns of World War II were fought. Admiral Harry D. Felt, Commander in Chief, Pacific, with headquarters at Camp Smith, Hawaiian Islands, is responsible for United States military interests in an area of approximately 85 million square miles, generally from the US west coast westward to the Burma-East Pakistan border and from pole to pole. The three service components are USARPAC (United States Army, Pacific), PACFLT (Pacific Fleet), and PACAF (Pacific Air Forces).

This abandonment of unified command did not extend to operations. MacArthur appreciated fully the im-

portance of a single commander to direct and coordinate the efforts of all forces—ground, sea, and air—actively engaged with the enemy. Better than most, he had reason to know that without this control the commander might be helpless to influence the outcome of battle. Such had been the case at Leyte, where much of his difficulty, he claimed, stemmed from the fact that Halsey was not under his command. Thus in his plan for reorganization, MacArthur provided for unity of command for specific operations under joint task force commanders chosen from the service having the paramount interest.

Army View Upheld

In Washington, the Army staff supported MacArthur's views, while the Navy held out for a separate Japan area. The issue was critical to both, for on the outcome depended control of the final operations against Japan and much of the credit for the victory against Japan. In the end the Army won out and on 3 April General MacArthur was named Commander in Chief, US Army Forces, Pacific, in addition to his command of the Southwest Pacific Area, thereby acquiring administrative control of all Army resources in the theater except for the 20th Air Force. At the same time, Admiral Nimitz, while retaining his Pacific Fleet and area commands, gained control of all US naval forces in the theater.

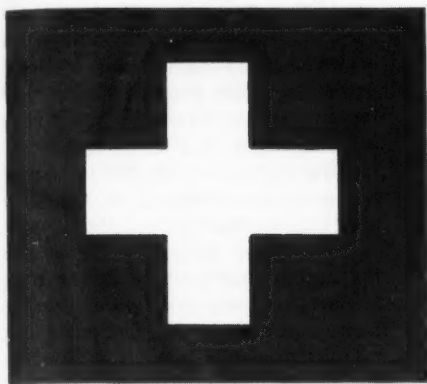
The 20th Air Force constituted in effect a third separate command for the Pacific, although it did not have the status of the Army and Navy commands. General Arnold argued strongly for equal representation for all Army air forces in the theater, but without success. Failing in this, he

proposed the establishment of a Strategic Air Force for the Pacific under General Spaatz, to include the 20th and the 8th Air Forces. Despite the objections of MacArthur, this proposal was adopted and less than a month before the Japanese surrender, US Strategic Air Force, Pacific, began operations.

Thus when the war came to an end, forces in the Pacific were organized into three commands, with Spaatz in a position of near equality with MacArthur and Nimitz. But there was no one man who could tell them what to do—only the Joint Chiefs as a body could do that. All efforts to establish a supreme commander for the theater had failed, and even the unified commands set up in 1942 for the Southwest and Pacific Ocean Areas had finally been abandoned.

By August 1945, therefore, command in the Pacific had made a full circle. Service interests and prestige, doctrinal differences and points of view developed over a lifetime of training and experience, personalities and the traits of higher commanders—all these had had a vital effect in shaping the organization of the Pacific. And in the end they combined to frustrate the establishment of a truly unified command.

Unification in 1947, far from resolving these differences, in some respects sharpened them. The addition of a third service increased the possible areas of disagreement. Today, in the twilight of the cold war, American military leaders speak with several voices. The experience of the Pacific war foretold the problem we would face in peace. Perhaps we could pay more heed to the lessons of history.



REORGANIZATION OF THE SWISS ARMY

Major Hans Rudolf Meyer, Swiss Army

IN ADDITION to maintaining peace and order in the interior, the Swiss Army must uphold the nation's independence. It must prevent enemy aggression and guarantee effective defense in case of an attack. Certain difficulties, arising from Swiss neutrality, commit the nation to a "wait and see" attitude. The purpose of the army is the same as in the past: pure strategic defense is its guiding principle.

The possible threats to Switzerland are the same as always: direct attack intended to eliminate the state; use of Swiss territory as passage, or for the establishment of communication lines; use of the nation's airspace; contagious unrest in neighboring states; and violation of Swiss territory during large combat actions near the borders.

From the beginning of discussions of military reorganization after World War II, it was clear that the army had to be organized in such a way that its very existence and strength would keep war away from the country. If that aim should fail, the army

should then be able to prevent the enemy from occupying the country or from passing through to fight a neighboring state. The army should also be in a position to fight an opponent equipped with either conventional or nuclear weapons.

During military planning, the prevailing political, psychological, financial, and economic conditions were taken into consideration. Compulsory military service and the militia system were retained, and it was decided that these principles would be adhered to for military as well as political reasons.

In 1955 Swiss military authorities proposed these principles for reorganization: The fire and striking power of the army must be increased; the army must be organized in such a manner that it is mobile; the units must be dispersed to reduce vulnerability to nuclear weapons.

Translated from the original article which appeared in WEHRKUNDE (Federal Republic of Germany) April 1961.

A minority group argued that the army should be organized for defensive action on prepared terrain, with all efforts geared to the increase of firepower and reinforcement of positions. Discussions dragged on through 1958-59. The Federal Council announced and published its principal decision late in 1959, and revised its proposals during the first half of 1960.

The guiding principles for the development of the army were summarized as:

1. The army must be capable of offensive as well as defensive fighting.
2. The armed forces must meet the requirements of neutrality.
3. Air force and air defense must be developed.
4. The entire military must be subject to unified command.

Topographical Factors

Consideration of the various tasks of the army, as determined by the topographical aspects of the country, led to dividing the army into units to be employed in the border areas, in the mountains, and in the interior.

The task of the frontier troops is primarily to block inroads to the interior, in order to facilitate mobilization and assembly. They are intended especially to force the enemy to fight at or near the border, and to prevent him from joining paratroopers landed in the interior of the country.

The defense of the Alpine region is to be entrusted to a newly created mountain army corps. Its task is to defend the frontiers to the south, to hold the Alps, and to protect the army installations located within the Alpine area.

The task of the inland forces is to resist an enemy who has pushed through the frontier or Alps zone or who has landed from the air. Newly

established mobile firepower units are assigned this mission. These units can be deployed during daylight hours, if necessary, under protection offered by the air and air defense forces. Fighting the enemy in the interior by attacking from assembly positions does not preclude defense from organized positions by segments of the army.

It has been necessary to increase the striking power of the Swiss Army so that it can successfully perform the tasks outlined for it. The most significant measures taken for this purpose have been an increase in firepower, the improvement of mobility of the ground forces, and modernization of air defense.

Weapons Requirements

Increased firepower was sought on all levels and for all arms. The infantry and mobile troops, for instance, are being equipped with automatic rifles. A new machinegun and new air defense weapons are being adopted. Efforts were made to extend the range of antitank weapons and artillery. The Federal Council has decided that nuclear weapons shall be procured for the reinforcement of the country's defense as soon as they are available to Switzerland.

Reform of the army demanded a more suitable organizational structure. The Swiss Army as now organized incorporates the following units: four corps (three field and one mountain); 12 divisions (three mechanized, three field, three frontier, and three mountain); aviation and air defense troops; frontier brigades; fortification brigades; redoubt brigades; and territorial forces.

As a fundamental measure, the age limit of liability for service was reduced from 60 to 50 years of age. Provisions were made to regroup the army

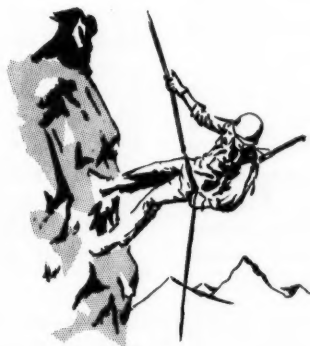
classification by stages in order to ensure that the reduction in strength incurred by lowering the age limit could be held within acceptable limits. Because of the unchanged general compulsory service, the Swiss Army will continue to have sufficient troop strength. Lowering the upper age limit for compulsory service improved the physical quality of defense personnel. War industry, moreover, can still be supplied with additional manpower in case of mobilization.

The Swiss Tradition

The Swiss Army has adapted its organization and armament to the demands of modern warfare. The evolving problems have been limited to those of organization and armament. Swiss valor, and the close relationship between the population and the army, have been strong through the past decades and, without doubt, will continue.

Over the centuries the Swiss capability of defense has increased steadily; the necessity of constant preparedness has accompanied the nation to the present day. The very existence of the country has at no time been taken for granted, and the road to liberty has not always been peaceful. Without blood sacrifices and without constant preparation for the worst, Switzerland would have ceased to exist long ago. The preparedness of the whole nation, and its capabilities, have maintained Switzerland's present position among Europe's nations.

The idea of defense has always been popular in the Swiss nation, and each Swiss citizen has a feeling of attachment toward his army. The unity of the people and the army is itself the reason for Switzerland's strength. Because of that unity, it can be said that Switzerland does not *have* an army, it *is* an army.



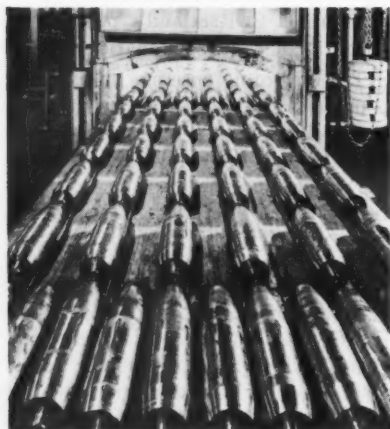
MILITARY

NOTES

UNITED STATES

Ammunition Production Stepped Up

The Army will procure 440 million dollars worth of ammunition under the provisions of the Fiscal Year 1962



US Army

105-millimeter howitzer shells come off the assembly line

budget. This is an increase of 160 million dollars over the 1961 budget for this purpose. Most of the funds will be used to purchase ammunition for conventional weapons. Antitank and artillery ammunition and conventional missile warheads will receive major attention.—News release.

Flood Control By Army Engineers

A saving of 10 billion dollars during 25 years, as a result of flood control measures undertaken and developed by the Army's Corps of Engineers, has been announced by the Chief of Engineers. Beginning in 1936 the Corps of Engineers was assigned the task of building dams, reservoirs, levees, and other works for the control of high waters.

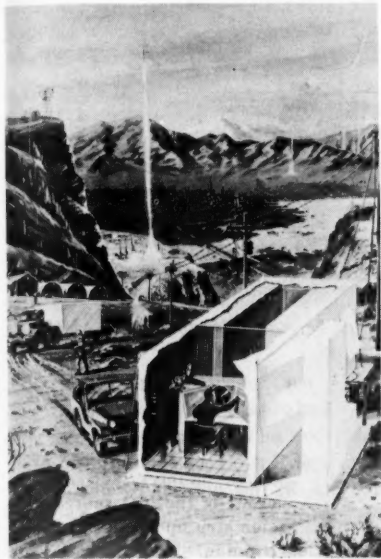
The frequency of floods claiming 100 or more lives has been cut from one every three years between 1900 and 1940 to about one every 10 years since 1940, when the initial effects of flood control projects began to be felt.

The Army Engineers' flood control program embraces about 900 projects, either completed, under construction, or yet to be started. Completed, or under construction, are 220 dams with reservoirs capable of holding back 90 million acre-feet of water—enough to make a two and one-half-foot-deep lake the size of the State of Illinois. Authorized by Congress but not yet started are over 120 additional reservoirs, and about 3,100 miles of levees and floodwalls as well as 3,300 miles of channel improvements.—News release.

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Midget 'Missile Master'

A midget *Missile Master*, unofficially called BIRDIE, which occupies 97 percent less space, uses 95 percent less power, and requires 80 percent fewer personnel than its large-size



US Army

Artist's conception of BIRDIE system in operation

counterpart, has been accepted for use by the Department of the Army.

Nineteen of the pocket-size air defense coordination systems will be used to protect military installations or cities in the 600,000-population class.

BIRDIE (Battery Integration and Radar Display Equipment) is a transistorized version of *Missile Master*, the giant nationwide coordinating communications system which uses information it picks up by radar or information fed into it regarding identity of friendly or enemy planes.

BIRDIE processes and distributes target information to guided missile

batteries and coordinates *Nike Ajax* and *Nike Hercules* missile fire. It can operate independently in its own area or as part of an over-all system.

The first BIRDIE was installed at Turner Air Force Base, near Albany, Georgia, in September. It is a small type, directing fire of a limited number of units. Larger units will be capable of storing, processing, and continuously updating target information and directing fire of a great many missile batteries. No announcement has been made of where the other 18 BIRDIE's will be located.

The first such system off the production line is to be operated by per-



The Martin Company

Card mounted plug-in electronic circuits are used in the miniaturized data processor of the BIRDIE system

sonnel of the United States Army Air Defense Command (ARADCOM) and will be tied into the North American Air Defense Command (NORAD).

The average BIRDIE costs approximately half a million dollars.—News release.



Tank, infantry, and artillery crews of the 2d Armored Division step up combat readiness training.—US Army Photos.



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New Roles For Posts And Units

A number of United States military posts have received new roles and designations incident to the current buildup of forces. The following is a summary of the major actions announced by the Department of the Army:

Fort Benning, Georgia: The 2d Infantry Division will convert from a training division to a combat division. The reception station at Benning will close.

Fort Bragg, North Carolina: The 5th Special Forces Group is to be activated at Bragg with an initial strength of 200 men and an eventual strength of 850 by the end of June 1962.

Fort Carson, Colorado: An Army training center was established here effective 7 September. The reception station previously at Fort Riley, Kansas, moved to Carson on 28 August. The training center will have a cadre of about 4,000 and a trainee capacity of about 16,000.

Fort Chaffee, Arkansas: This post will be reopened as an Army training center. The 100th Training Division recently called to active duty from the US Army Reserve will be stationed here.

Fort Gordon, Georgia: Training facilities will be expanded to provide basic combat and infantry advanced training for about 8,000 soldiers.

Fort Lewis, Washington: The 32d Infantry Division, called to duty from the Wisconsin National Guard, will be stationed here. This is a two-division post. The 4th Infantry Division is now stationed at Lewis.

Fort Polk, Louisiana: Inactive until the latter part of August, Fort Polk has been reopened. The 49th Armored Division, a recently federalized Texas

National Guard unit, will be stationed here.

Fort Hood, Texas: The 2d Armored Division will convert from a training division to a combat-ready division. The reception station at Hood will close.

Camp Irwin, California: This post has been redesignated as Fort Irwin, giving it the status of a permanent installation. It will continue to serve as an armor firing center and a desert training center for armor and artillery.

Fort Riley, Kansas: The 1st Infantry Division converted from a training division to a combat division. The reception station here has moved to Fort Carson, Colorado.—News release.

'Pershing' Training Starts

Training has started for the first key civilian and military specialists who will have a part in the operation, maintenance, and support of the *Pershing* missile when it becomes operational. The initial training is being conducted at the plant of the prime contractor for the *Pershing* system in Orlando, Florida, under the direction of the Army Ballistic Missile Agency Training Office. Courses ranging from six to 16 weeks' duration will be offered the select group in 12 different specialty areas. A total of 250 specialists will be trained in this program during the next few months.

The *Pershing* system (MR, Oct 1961, p 103) is now undergoing a highly successful test program at Cape Canaveral, Florida. Operation of the missile's two solid fuel rocket motors, and the separation of the warhead section at conclusion of powered flight were attained in a recent test.—News item.

New Artillery Pieces

Shown in the accompanying photographs are the Army's new 8-inch howitzer (above) and 175-millimeter gun (below) which are scheduled for quantity production early in 1962.



US Army

A single type of standardized light-weight vehicle is provided for these two weapons. The vehicle has a hydraulically operated spade at the rear

tons. Either weapon can be air transported in large cargo aircraft. Both weapons are provided with mechanical loading and ramming devices



US Army

which anchors it firmly during firing. A wheel lockout system transmits recoil shock directly to the ground. A 420-horsepower engine powers the vehicle at road speeds up to 34 miles

which permit their operation with a guncrew of only five men. The 8-inch howitzer has both a nuclear and a conventional ammunition capability. —News item.

Unified Command For TAC And STRAC

The Secretary of Defense has announced that the forces of the United States Strategic Army Corps (STRAC) and the Tactical Air Command (TAC) will be combined to form a new unified command under a single commander in chief. A US Army lieutenant general has been selected as the initial commander of the new force.

The decision to establish this new unified command was made by the President based on studies conducted by the Joint Chiefs of Staff and the recommendations of the Secretary of Defense.

It is expected that the new command will be formally established before the end of the year, after completion of studies by the Joint Chiefs of Staff on detailed force structure and other arrangements. The unified command will substantially increase the flexibility, readiness, and combat effectiveness of the forces assigned.

The new command will provide combat-ready land and tactical air forces which can be moved rapidly when required to augment US forces already deployed or to carry out such other contingency missions as may be assigned by the Secretary of Defense or the Joint Chiefs of Staff. It will develop doctrine for the integrated employment of the land and tactical air forces assigned and will be responsible for the training necessary to weld these forces into an efficient land-air team. The command will conduct regular training exercises to ensure a high level of combat effectiveness and a rapid reaction capability.

The forces of STRAC and TAC now include the US-based, combat-ready, land and tactical air forces of the Army and the Air Force.

STRAC consists of the Headquarters, 18th Airborne Corps, located at Fort Bragg, North Carolina; the 82d Airborne Division, also at Fort Bragg; the 101st Airborne Division at Fort Campbell, Kentucky; the 4th Infantry Division at Fort Lewis, Washington; and a large number of combat, combat support, and logistical units not assigned to divisions.

TAC is a major Air Force command with headquarters at Langley Air Force Base, Virginia. TAC includes tactical fighter, tactical reconnaissance, troop carrier, and air refueling wings, along with training, airbase, and other supporting units. Subordinate headquarters of TAC include the 9th Air Force at Shaw Air Force Base, South Carolina; the 12th Air Force at Waco, Texas; and the 19th Air Force at Seymour Johnson Air Force Base, North Carolina.—News release.

Air Trailer

A major United States manufacturer has developed a proposal to carry heavy air cargo loads in a trailer-type aircraft linked to a conventional air transport by a semirigid tow bar. The concept, now in the drawing board



Proposed air trailer

stage, visualizes an air vehicle capable of carrying loads 24 feet in diameter, 90 feet long, and weighing up to 50 tons. Larger models, capable of carrying heavier loads, are considered feasible.—News item.



A technician, using an image intensifier television camera, photographs enemy tanks operating under cover of darkness (above). Observers plan countermeasures on the basis of information displayed on their television monitor (below).—US Army Photos.



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Orthicon Night Vision Device

A new device developed for the Army will make it possible to obtain television pictures at night using available starlight, moonlight, or natural skyglow. The device is based on an electronic tube which amplifies natural light 100,000 times and uses it to provide an amazingly clear picture of a large area at night.

Called an image intensifier orthicon, the new development is a combination of an image tube and an image orthicon tube of the type used in an ordinary television camera. The image tube is similar to that used in the infrared sniperscope, but has been made sensitive to natural light instead of infrared.

In a recent demonstration observers located far back from the shoreline were able to watch an "enemy" landing operation at night. Individual boats could be seen as far out as the third landing wave as they approached the beach.

The image intensifier orthicon is one of a family of tubes being developed by the United States Army Engineer Research and Development Laboratories to enable troops to observe, fight, move, and work in the dark.—News release.

POLAND

Polish Military Academy

The Polish Military Academy, now 10 years old, presents a three-year course of instruction. Students include commissioned officers, noncommissioned officers, and selected students with no previous military experience. Most students, however, have completed at least one year of basic military training.

The graduate of the course receives

the title of engineer and, if not previously commissioned, is appointed a lieutenant in the "people's" army. The academic year extends from September through June. The months of July and August are used for field training and vacations. Subjects presented during the course include electronics, ground force tactics, automotive science, and aviation engineering.—News item.

INDIA

All-Purpose Jet Fighter

India has developed, built, and successfully tested a supersonic jet fighter aircraft capable of operating at low speeds as well as at speeds in excess of Mach 2. Nearly 50 percent of the components in the new aircraft were built in India. It uses two *Orpheus 703* engines which are built at Bangalore under a license from a British manufacturer.

Designated the *HF-24*, the aircraft is primarily a fighter but was designed with an "all-purpose" application in mind.—News item.

PAKISTAN

Australian Technical Assistance

Australia has assisted Pakistan in the establishment of technical services within her army, under the South-east Asia Treaty Organization's technical assistance program. Projects supported by Australia include the establishment of a new electrical and mechanical engineering school for the army at Quetta. Australia also has trained junior engineer officers from Pakistan and has furnished equipment for an engineering college at Risalpur and for an electronic facility of the army apprentices' school at Rawalpindi.—News item.

BELGIUM

Force Structure

The Belgian Army now contributes one infantry and one armored division to the allied forces deployed in Germany. In addition, the country maintains three aircraft wings of interceptors and fighter bombers and operates a naval force of approximately 50 minesweepers. Reserve



Well-trained Belgian soldiers contribute to the strength of Western Europe

forces retained in Belgium include paratroop battalions, service units, and a cadre of approximately 10,000 officers, noncommissioned officers, and soldiers engaged in recruit training.

Compulsory military training laws instituted in 1958 reduced the basic service period from 18 to 12 months. This reduction in the term of service has been balanced by a voluntary enlistment program for the NATO contingents which provides for service for periods of from three to five years. Soldiers who complete this service can elect to become career soldiers or to enter the nation's police or customs service.

Belgium is engaged in a five-year modernization program for her NATO forces while concurrently reducing her

military budget. Most of the planned reduction will be accomplished by cutting down service-type units and administrative overhead.—News item.

WEST GERMANY

Plastic Steel

A new material, which may have significant military applications, has been announced by a German source. The material is a plastic metal capable of being formed, cast, drilled, filed, sawed, or ground. It can be used to connect other metal parts under conditions which would make welding or other more conventional forms of fastening difficult.

The plastic steel is a compound consisting of 88 percent metal and 12 percent resins. In use it is mixed with a hardening agent, and formed in place. It has been used in the automotive field to repair radiators and cracks in motor blocks, and to repair gasoline tanks without the danger of explosion incident to welding.—News item.

GREAT BRITAIN

The 'Chieftain' Tank

Additional details recently made available on Great Britain's new battle tank, the *Chieftain*, indicate that it has a multifuel engine capable of operating efficiently on diesel oil, aircraft fuel, or ordinary gasoline.

Lighter weight and a low fuel consumption rate are reported to give the new vehicle a 60 percent greater operating range than its predecessor, the *Centurion*. The *Chieftain's* engine is rated at approximately 700 horsepower.

The tank has a low silhouette which was attained by placing the driver's seat in a reclining position, and thereby reducing the height necessary for the crew compartment.—News item.

The 'Miller' Cable Bridge

The accompanying photographs illustrate the use of a wire cable bridge for the passage of vehicles over obstacles on the battlefield (MR, Aug 1961, p.105). A bridge of this type, capable of spanning a 200-foot gap, weighs only 1,600 pounds. It can be installed by 20 men in three hours and is relatively invulnerable to bombing.

The cable bridge—called the *Miller* Bridge, for an Australian Army officer who used a similar technique in Malaya recently—is simple to erect, costs virtually nothing to maintain, and is rapidly dismantled.

The bridge requires about 450 feet of steel cable, two pieces of mesh track, 200 steel pegs, a winch, and securing tackle. The track is pegged to the ground on each side of the gap, the cables run to the opposite bank and back, and are fastened and winched to the correct tension. The vehicle, fitted in five minutes with flanged hubs which fit over the wires, then



British Information Services

A mechanic attaches the flanged hub to the vehicle. This operation requires about five minutes.

drives onto the cable and over the bridge under its own power.

Work is now being done on another type of light cable bridge which supports a vehicle from above and below. —*Courtesy Soldier*. By permission of the Controller of Her Majesty's Stationery Office.



Passage completed, the vehicle and its trailer roll to the far side of the obstacle

USSR

Radiological Defense Training

The Soviet Army is emphasizing radiological defense measures in individual and unit training according to recent articles in Soviet military journals. Specific instruction covers passive measures such as decontamination of individuals and equipment, use of protective clothing and equipment, methods of detecting and marking contaminated areas, and tactical considerations involved in operating in and through radioactive areas. Particular emphasis is apparently given to the recording of the accumulated dose of radioactivity to which the soldier is exposed.

The Soviet forces are to be provided with radiation detection and recording devices on both an individual and



A platoon sergeant assists one of his men as he puts on protective footwear designed to reduce exposure while moving through a contaminated area



Two Soviet soldiers study a detection device used to determine the intensity and limits of a radiologically contaminated area

an organizational basis. Each individual is to be issued a chemical dosimeter, *DP-70*, which changes color when the bearer has been exposed to a hazardous dose of radiation. Group exposure is to be recorded with the aid of a *DP-2* or *DP-3* roentgenmeter or a *DP-63* indicator of radioactivity.

The date of issue and the serial number of the individual dosimeter is recorded on the soldier's pay record or the officer's identification card. Verifying that individuals have their dosimeters in their possession and the detection of an incident of exposure is a command responsibility.

Each squad is issued one or two *DC-50* dosimeters which record the



This photo shows troops moving through a contaminated area carrying what appear to be protective sheets on which to lie when hitting the ground. The Russian caption on this photo emphasizes that protective measures slow up movement, but that the momentum of the attack must be maintained.

accumulated exposure. After each operation these dosimeters are collected and the accumulated dosage is read and recorded by the battalion chemical instructor. The meters are then recharged and returned to the unit.

Company officers carry a "direct-read" dosimeter. A logbook is maintained in the company in which the accumulated dosage incurred by each soldier and officer is recorded. Peri-



Wearing protective capes, gloves, and footwear, two soldiers mark the five-rad contour of a radioactive area

odic reports are rendered through command channels on the dosage accumulated by the unit.

The DP-63 indicator of radioactivity provides a record of intensities incurred during specific times of exposure. For example, during the first hour the meter may record eight roentgens, the second hour, six roentgens, and the third hour, five roentgens for a total of 19 roentgens over a three-hour period.—News item.

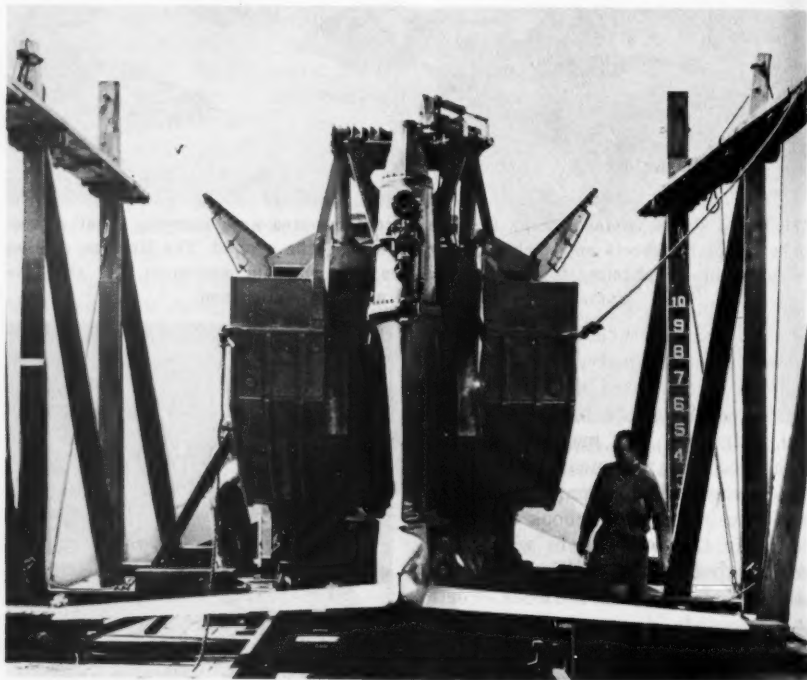


A soldier wipes contaminated particles from his weapon during a lull in battle

UNITED STATES HYDROFOIL AMPHIBIANS

The revolutionary hydrofoil concept, which has enabled boats to "fly" above a water surface at high speeds, has been experimentally adapted to amphibious vehicles of the landing craft type. A number of authorities have predicted that the hydrofoil-equipped

Ordnance, that a fully amphibious vehicle can be fitted with submerged hydrofoils and powered by a gas turbine. The original military goal was to develop a multipurpose vehicle for speedy transport of troops and supplies over long distances, even in heavy



The *Flying Duck* in drydock showing the aft foil and the foil-mounted propeller

amphibious craft will eventually replace the conventional type.

The *Flying Duck* (hydrofoil version of the DUKW) was developed under Army contract, and first tested in 1959. Other amphibious hydrofoil craft have more recently been developed and tested.

The *Flying Duck* and its competitors have proved, according to US Army

seas. The vehicles have been intended to operate from shore-to-shore or from ship-to-shore, and to be capable of carrying a variety of weapons for special missions.

The *Flying Duck* lifts out of water at a speed of about 13 knots; in normal high-speed operations only the two forward hydrofoils and the aft foil travel within the water, at a

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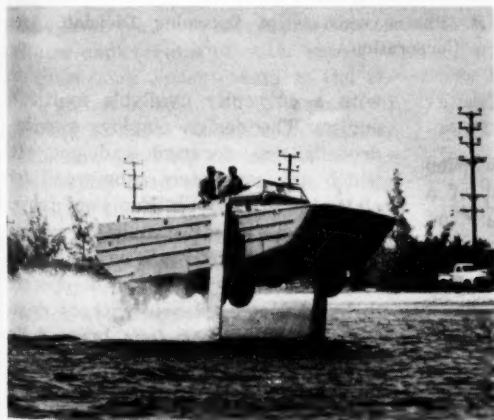
A *Flying Duck* approaching takeoff speed

After a 200-foot taxi run the *Duck* clears the water



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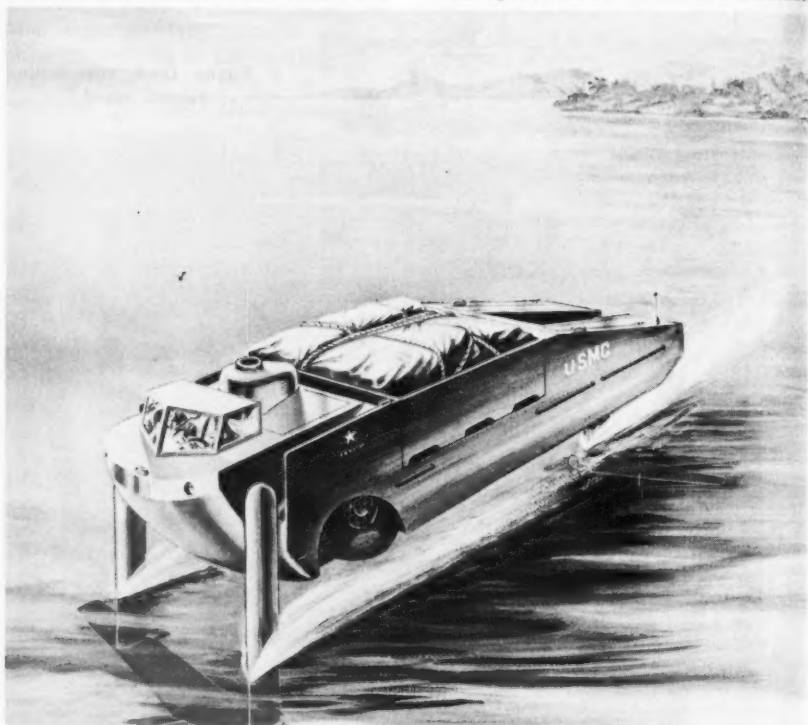


Fully foil-borne, the *Duck* can reach speeds in excess of 40 miles per hour

Review

depth of 30 inches. At a speed of 30 knots, the craft can operate for five hours without refueling, covering distances of about 150 nautical miles. The

craft is to be capable of transporting several thousand pounds at speeds up to 45 knots through rough seas. Overland speeds of 25 miles are feasible



Artist's concept of the new LVH.—Photos courtesy of Lycoming Division, Avco Corporation.

foils are swivel-mounted, and lift clear for land travel.

The US Navy has recently awarded a contract for the development of a Landing Force Amphibious Support Vehicle, Hydrofoil (LVH) designed to transport cargo during the assault phase of an amphibious operation from widely scattered landing ships dispersed offshore.

Design specifications call for a gas turbine-powered hydrofoil craft. The

with a currently available multifuel engine. The design employs two hydrofoils, one forward and one aft, which are completely submerged for all water operations. For land travel they are retracted completely within the hull. The foils are self-cleaning and structurally designed to operate through floating debris without damage. The craft has four large fully retractable wheels. Power steering is provided for the front wheels.—News item.

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MILITARY

BOOKS

SCIENCE IN SPACE. Edited by Lloyd V. Berkner and Hugh Odishaw. 448 Pages. McGraw-Hill Book Co., Inc., New York, 1961. \$7.00.

By MAJ LOUIS RACHMELER, *OrdC*

Why go to the moon? The general public has discussed this question ever since President Kennedy asked Congress to support a program for placing a man on the moon and returning him safely to earth within this decade. Congress considered many factors before underwriting such a program.

Some Congressmen may have felt that it was a matter of national prestige; others, that what could be learned from such an achievement might have commercial value; still others, that science could be advanced by such a program. Taking a military viewpoint, others doubtless concluded that the United States should get to the moon first to prevent any other nation from employing the moon as a base from which to bar future United States explorations of outer space.

Science in Space considers the entire gamut of basic scientific problems related to space research. H. C. Urey tells how physical exploration of the moon may lead to knowledge of the birth of the universe. A biologist reports that exploration of Mars or Venus may lead to discovering extra-terrestrial forms of life (a discovery which would undoubtedly be the greatest of the age).

Advances already made in the space program are discussed in six chapters relating to the sun-earth relationship.

A HISTORY OF THE UNITED STATES SIGNAL CORPS. By the Editors of the Army Times. 186 Pages. G. P. Putnam's Sons, New York. \$5.95.

By RUDOLPH L. HOELTZEL

One of the striking matters brought to light in this account is the great variety of activities engaged in by the Signal Corps. Having come to lusty birth during the Civil War, the corps began at once to perform its central task of communication in warfare. The balloon reconnaissance episodes of those years marked this service as one from which the unusual could be expected.

The corps' history has been marked by such episodes. It pioneered a national weather forecasting system in the 1870's. It sponsored the tragic Ellesmere Island meteorological expedition under Greeley. In the Spanish-American War, it chartered the German ship *Adria* to cut Cuban underseas cables, and sent up the antique reconnaissance balloon employed at San Juan Hill. It sponsored Langley's attempts at flying a heavier-than-air machine, and directed Army aviation in World War I.

This book is at its best in re-creating high points of Signal Corps history; it is somewhat weaker in tracing development of the corps' mission and capabilities. The account does not arrive at a balanced evaluation of the corps' present situation, but does accomplish what it sets out to do—to present an entertaining and absorbing narrative.

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Review

STRATEGY AND ARMS CONTROL. By Thomas C. Schelling and Morton H. Halperin. With the assistance of Donald G. Brennan. 148 Pages. The Twentieth Century Fund, New York, 1961. \$2.50 clothbound. \$1.25 paperbound.

BY LT COL FRANCIS J. KELLY, *Armor*

Two members of Harvard's Center for International Affairs here assess the complexity of "arms control." The book sheds needed light on the meaning of "arms control," and on its economic and strategic implications.

The authors' basic premise is that all forms of cooperation between potential enemies should be explored in the hope of reducing the likelihood or scope or violence of any future war, even while the political and economic costs of war preparedness are also being considered.

The authors offer no panaceas. Indeed, their constant references to the complexities of arms agreements and to the methods and consequences of circumventing such agreements attest to their down-to-earth awareness of the problem. The logic of the report is sound, yet it seems reasonable to suggest that the programs recommended here might be found unusable by those negotiators who day after day face Soviet deviousness and intransigence.

The report could have been improved by a more thorough treatment of arms control in relation to the cold war. The authors consider cold war to be a period of uneasiness preliminary to limited and then possibly general war. Cold war defined as a state of undeclared war, or as the absence of declared war, might have proved a more viable concept.

The book is a worthwhile contribution to a subject needing much clarification.

CORUNNA. By Christopher Hibbert. 216 Pages. The Macmillan Co., New York, 1961. \$4.50.

BY COL ERVAN F. KUSHNER, *USAR*

On 18 September 1808, Sir John Moore, a dedicated soldier of England and her best training officer since Sir James Wolfe of Quebec fame, was named commander in chief of an expeditionary force assigned "to cooperate with the Spanish Armies in the expulsion of the French" from Spain.

On 15 January 1809, some 120 days later, Moore was dead, a gunshot casualty on the field of battle. The hopes and aspirations of a decimated British Army had been destroyed as it resolutely awaited evacuation by sea from Corunna, a tiny seaport town in northwest Spain.

Corunna is the first book ever devoted exclusively to the British Dunkerque of the 19th century; there is a striking parallel between the operation it describes and that which took place on the north coast of France over a century later.

Moore's was an expedition doomed from the start. Napoleon, unbeaten and the ruler of all Europe, opposed him with far superior forces. Deep in enemy territory, Moore found that he had overextended his lines of communication and was in imminent danger of a Napoleonic thrust around both exposed flanks and rear. Reluctantly, he decided to withdraw.

At Corunna as at Dunkerque the English, in a perimeter defense fought the enemy to a standstill and succeeded in embarking the remnants of the army.

Corunna is the ninth volume of the "British Battle Series." Its illustrations and maps are superb. It is evident that the book is a product of careful and accurate research.

THE FIFTEEN DECISIVE BATTLES OF THE UNITED STATES. By O. K. Armstrong. 370 Pages. Longmans, Green & Co., Inc., New York, 1961. \$5.95.

BY COL W. W. ANDERSON, *USAR*

There might be some argument—but very little—about the selection of battles recounted in this very readable book relating to American history from the time of a colonial fight for independence in 1742 through the bombardment of Germany in World War II.

James Oglethorpe was commander in the first battle, defeating the Spanish at Forts Frederica and St. Simons off what is now Brunswick, Georgia. Then came Wolfe, in 1760, defeating the French at Quebec.

Canada remained British after the campaigns against Quebec which saw General George Washington emerge as commander of the American Army. If he had won, the political map of the North American Continent would have been changed.

During the American Revolution occurred the surrender of Burgoyne at Saratoga in 1777 and Washington's victory at Yorktown.

Oliver Hazard Perry fought on Lake Erie under a flag given him by a lady who had sewn on the banner the slogan, "Don't Give Up the Ship." He subdued an entire squadron of British—the first such achievement in history. Andrew Jackson, at New Orleans, also defeated the British and settled the question of sovereignty over Louisiana.

Next came Houston, winning independence for Texas; Zachary Taylor at Buena Vista; Grant at Vicksburg; Lee, defeated at Gettysburg; Dewey conquering the Spanish in Manila Bay; Americans at the Marne in World War I; the naval defeat of Ja-

pan in the Pacific in World War II; and the American bombardment of Germany.

The book comes at a time when Americans wonder what the next battle may be—and where and when.

WAKE ISLAND COMMAND. By W. Scott Cunningham with Lydel Sims. 300 Pages. Little, Brown & Co., Boston, Mass., 1961. \$4.95.

BY LT COL WILLIAM N. MARTASIN,
AGC

Rear Admiral Cunningham, US Navy, Retired, tells another side of the Wake Island defense story. As commander of that island outpost from 28 November to 23 December 1941, he directed a defense against overwhelming odds and finally made the decision to surrender his beleaguered garrison.

A considerable part of this book is devoted to setting straight the record—to the effect that Cunningham, not Marine Major Devereux whose name is oftenest linked with this gallant action, was the over-all commander responsible for the defense of Wake.

The author's description of the 14 days of Japanese attacks and of the defenders' skillful use of meager resources constitutes a vivid battle report. Cunningham alleges that:

The mishandling and final recall of a relief expedition that almost without doubt could have saved Wake from the enemy, and scored a great naval victory in the process, was one of the darkest marks on the Navy's entire war record.

After surviving four years of prison, near-starvation, bestial punishment for two escapes, and mental torment over possible reaction to his surrender, Admiral Cunningham returned to find that his part in this episode had been largely ignored.

CHARGE! The Story of the Battle of San Juan Hill. By Colonel A. C. M. Azoy. 182 Pages. Longmans, Green & Co., Inc., New York, 1961. \$3.95.

BY LT COL WILLIAM D. BEARD, *Inf*

This is a compact and interesting account of events leading up to the declaration of war with Spain in 1898; the mobilization of the V Corps for the invasion of Cuba; and the campaign in Cuba culminating in the surrender of the Spanish forces.

The campaign of the V Corps in Cuba, although not large when compared with those of the later World Wars, is significant because the weaker force, fighting on foreign soil, was victorious after fighting only one major engagement.

The V Corps, composed of both Regular and Volunteer units, assembled at Tampa, Florida, in the spring of 1898. That this force ever arrived in Cuba is in itself remarkable, as the mobilization was accomplished with little or no advance planning by the War Department or even the regiments themselves.

The Cuba campaign was short, spectacular, and beset with numerous difficulties from beginning to end. The V Corps landed without proper equipment or reconnaissance of the landing areas, and fought several bloody engagements as it advanced through the jungle toward Santiago. It assaulted and captured the Spanish defenses on San Juan Hill, thereby causing the surrender of the Spanish forces in Santiago. The fact that the campaign was successful can be attributed to the courage, ingenuity, and resourcefulness of the commanders at the lower levels.

This campaign marked the end of an era. It witnessed the culmination of the distinguished military careers

of many Civil War officers such as Generals Shafter and Wheeler, and the beginning of the careers of officers such as Lieutenant Colonel Roosevelt and Lieutenant Pershing.

The author, a retired Army officer, served in both World Wars and has written several books and numerous articles on military and historical subjects.

THE BATTLE OF THE ATLANTIC. By Donald Macintyre. 208 Pages. The Macmillan Co., New York, 1961. \$4.50.

BY CAPT JAMES R. THOMSON, *USN*

This volume is one of a series written and published in Great Britain entitled the "British Battle Series" which covers eight selected campaigns such as *Trafalgar*, *Waterloo*, and *The Spanish Armada* with several more under preparation. "The Battle of the Atlantic" was coined as a phrase by Sir Winston Churchill to concentrate attention on the vital problem of keeping Britain in food and munitions via the sea lanes during World War II.

Captain Macintyre, Royal Navy, a naval historian and participant in this epic struggle, recounts the story of the battle to get the convoys through against the U-boats, surface raiders, and long-range aircraft. For the second time in a generation Great Britain was brought almost to total defeat through heavy destruction of her logistic means of survival. The lessons of the first Great War had to be relearned and technologically up-dated. It was in the Atlantic that the Allies had to win, and finally did.

Excellent accounts of individual actions on the part of both escort commanders and U-boat captains give an exciting personal realism to the struggle, while 54 photographs and diagrams enhance this readable volume.

THE SANDS OF DUNKIRK. By Richard Collier. 319 Pages. E. P. Dutton & Co., Inc., New York, 1961. \$4.50.

By MAJ ROBERT C. BURGESS, *Arty*

The critical days of late May and early June 1940 are recreated in this stirring account of the evacuation from Dunkirk. The author bases his descriptions on interviews or correspondence with more than 1,000 survivors of the action: soldiers, sailors, airmen, and civilians, of both sides, are included.

The reader can relive the bewilderment which struck all echelons when Hitler abruptly ended the "Sitzkrieg" and loosed his Nazi legions on the Low Countries and France. As the British Expeditionary Force withdrew before the onslaught, it became clear that evacuation to England offered the only means of preserving the fighting strength needed to repel the expected German invasion of Britain.

Once the decision was taken to evacuate, it was only through superhuman efforts on the part of all concerned—rear guard troops, naval beachmasters, and especially small craft operators (many of them civilian volunteers)—that the operation was carried off successfully. Although the great bulk of the army's equipment was left behind, a total of 366,162 people were ferried to England.

Although Mr. Collier painstakingly researched his subject, *The Sands of Dunkirk* is no mere compilation of statistics and procedures. His accounts of land, sea, and air actions afford the reader a complete perspective of the entire operation.

The result is a gripping tribute to the men of Dunkirk.

JAPAN SUBDUED. The Atomic Bomb and the End of the War in the Pacific. By Herbert Feis. 199 Pages. Princeton University Press, Princeton, N. J., 1961. \$4.00.

By MAJ JOHN R. TREADWELL, *Armor*

In this study the author does not write in terms of postwar problems but reflects on the necessity and wisdom of employing the atomic bomb—mistakenly referred to as the "ultimate weapon."

Japan Subdued relates the plans and acts of the Allied and Japanese Governments during the period in 1945 leading up to the end of the war with Japan. Feis discusses the alternatives open to the Allies to force Japan to surrender: whether to proceed with a combined assault, to soften the terms of unconditional surrender, or to shock the Japanese into submission with the atomic bomb.

This brief volume rounds out a series of diplomatic historical studies by the author on World War II. Like his other works, this represents an exhaustive research of primary sources. The author has a flare for developing an interesting narrative and is not reluctant to present his own viewpoint.

Each section raises more questions about events than it answers. Why did our Government persist in its attitude on Soviet entry into the war with Japan? What were our objectives in the war? Had we forgotten those beyond unconditional surrender? Did our haziness on objectives affect our appreciation of the atomic bomb's significance? The military student should read this book together with the author's other works—*The Road to Pearl Harbor*, *China Tangle*, and *Between War and Peace*—to develop a more thorough view of the events of the time and their consequences.

THUNDERBIRDS! By Martin Caidin. 256 Pages. E. P. Dutton & Co., Inc., New York, 1961. \$4.00.

BY MAJ BEDFORD D. MAY, USAF

This is the story of the United States Air Force's world famous aerial demonstration team. Author Caidin, a pilot, describes in detail the intricate maneuvers performed by the team. He is assisted by the line drawings of artist Fred Wolf.

When this book was written, the team had made 552 performances before over 40 million people in 40 different countries. Since then they have passed the 680 mark.

Mr. Caidin emphasizes one very important point. The team is not just performing aerial stunts. These men are demonstrating the marvelous precision of which today's combat aircraft and pilots are capable. This type precision is required in the accomplishment of tomorrow's air missions.

AERONAUTICS AND ASTRONAUTICS. An American Chronology of Science and Technology in the Exploration of Space 1915-1960. By Eugene M. Emme, National Aeronautics and Space Administration. 240 Pages. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. \$1.75.

Study of this book, plus a daily glance at the morning newspaper, may constitute as good a method as any by which the modern reader can attempt to keep up with events in a revolutionary field. The book is a no-nonsense compilation of facts in chronological order, data in tabular form, and well-indexed related materials.

The chronology begins at 1915 with the creation of the National Advisory Committee for Aeronautics (NACA), and traces the evolution of aeronautical and space sciences which followed

the contributions of the Wright brothers and Robert H. Goddard.

Prepared under the auspices of the National Aeronautics and Space Administration (NASA), the volume emphasizes scientific research and development, and demonstrates historic use of aircraft, rockets, balloons, and spacecraft as tools of research.

The historical impact of military rocket development and *Sputnik I* is shown, as is their influence on current events and the future. The author, an authority on airpower, is the NASA historian.

NOTES ON GUERRILLA WAR. Principles and Practices. By Colonel Virgil Ney. 185 Pages. Command Publications, Washington, D. C., 1961. \$3.50.

This compact volume is the product of well-documented research in the field of unconventional warfare which has been carefully evaluated and interpreted against the background of the author's experience. It is a creditable effort to reduce the factors in guerrilla war to a set of 10 principles to guide operators and planners in future operations.

The author's "principles" perhaps would be more properly labeled as "factors," a term applied freely in his discussion.

Particular emphasis is placed on the probable role of unconventional operations in a future war where nuclear weapons are used or the threat of such weapons exists. Colonel Ney states "The place of guerrilla war in the military art is an assured one. It has become a distinct branch of the art of war."

Specific discussions are devoted to propaganda, its value and use in guerrilla operations, and to guerrilla war under nuclear and chemical, biological, and radiological conditions.



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